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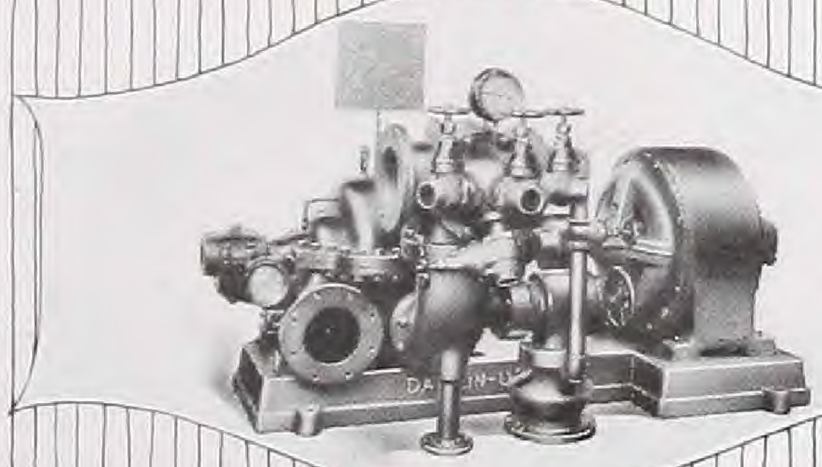
1.6

Dayton-Dowd Centrifugal Fire Pumps



BULLET.N 246

PHOTO BY EDWIN LEVICK, N. Y

ADEQUATE FIRE PROTECTION

The waste from fire losses in the United States is conservatively estimated at $300,000 000 a y which, however, represents only the physical loss of property. The additional loss from suspended busines almost beyond calculation. Certainly this appalling loss and waste should be a matter of much concern to ery business executive and adequate means taken to prevent such a catastrophe in his business.

A very large percentage of fires are preventable. Modern building design and construction usually cludes some type of fire protection apparatus independent of the local fire fighting units and the majority such fire prevention equipment consists of automatic sprinklers, or standpipe systems, and centrifugal pumps described in this bulletin.

TESTS AND APPROVAL

DAYTON-DOWD Underwriters Centrifugal Fire Pumps described in this bulletin have been tested approved by the Associated Factory Mutual Fire Insurance Companies as well as the National Board Fire Underwriters and meet the requirements and specifications of all Underwriters. The tests and investi tions conducted by the Underwriters Laboratories are very thorough, covering general design, methods construction including foundry and shop practice, practicability of installation and maintenance, strength durability, reliability of operation, and uniformity or interchangeability of parts. In addition to the prel inary investigations and tests the Dayton-Dowd Company has contracted with the Underwriters Laborato for yearly re-examination of their fire pumps which guarantees a constant, high standard of construction and sured dependability.

ADVANTAGE OF DAYTON-DOWD CENTRIFUGAL PUMPS

DAYTON-DOWD approved Underwriters Centrifugal Fire Pumps offer many advantages. The pu are of the automatically balanced type and consequently no thrust bearing troubles are experienced. The charge and suction openings are both brought out on the same side of the pump, enabling installation to made in cramped quarters. The pump can be installed to face the wall or not. By the use of a separate for the hose manifold the discharge can be arranged to point in any required direction. The pump is ways ready for duty and can be started instantaneous'y. There are no parts to stick, dry up or get out order.

CONSTRUCTION SERVICE

The building and installation of centrifugal fire pumps require close study of the Underwr requirements, as well as personal investigation and engineering survey of local conditions which always fluence the type of apparatus to be installed. The Dayton-Dowd Company is exceptionally qualified by experience in the building and installation of fire pumps to take complete charge of all details connected any fire pump installation and can assure the purchaser that the pump will meet all requirements of the derwriters Inspection Department. The purchaser is thus relieved of responsibility and perhaps much n less expense by the expert services of our engineering and construction departments. We are prepared to ecute complete contracts covering the furnishing of suitable equipment and installation work, or supply the pump with driving and control units for installation by the purchaser, in which case our engineering servic always available for suggestion or advice.

ECONOMY AND SAVINGS

Aside from the physical protection afforded by the installation of DAYTON-DOWD Centrifugal Pumps, large savings accrue as a result of reduced insurance rates on the risk so protected. These sav varying from 60 to 85%, are enough to repay the original investment within a few years, and the sav thereafter are net, and show a nice profit each year. There are several well reputed concerns who install tomatic sprinklers and fire pumps on a lease basis without capital investment on the building owner's part lowing the saving in rates to pay for the system, after which the system is released to the owner, who pr not only by increased assets, and adequate fire protection but by large savings each succeeding year in miums. The Dayton-Dowd Company invites correspondence relating to fire protection in your plant.

MOTOR DRIVEN CENTRIFUGAL FIRE PUMPS

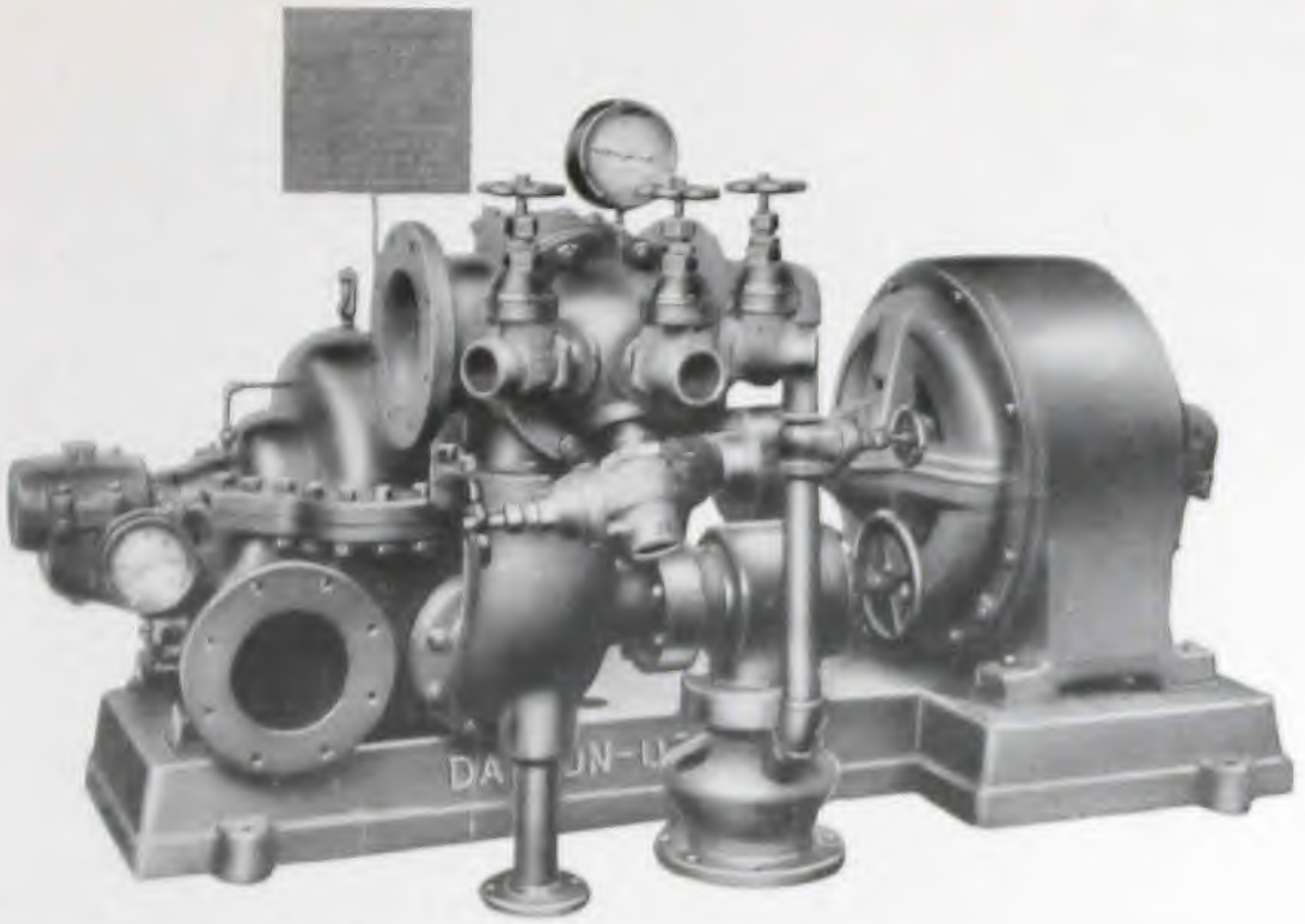


Fig. 126. Dayton-Dowd Approved Underwriters 1,000 Gallon Motor Driven Centrifugal Fire Pump. Four 1⅛" Hose Streams at 100 lbs. Pressure

Where electric current from a reliable source is available the motor driven Underwriters' Centrifugal Pump affords a thoroughly dependable fire protection unit. Each installation must be considered individually by the Inspection Department having jurisdiction, to determine the reliability of the current supply which is so affected by local conditions that only a personal investigation can determine this factor.

Motor driven centrifugal fire pumps are controlled by the manual type of starting equipment or by the combined manual and automatic type of control panel as specified by the Inspection Department, which must be of approved design for fire pump control.

Where conditions of installation require it motors are furnished totally enclosed and fan ventilated.

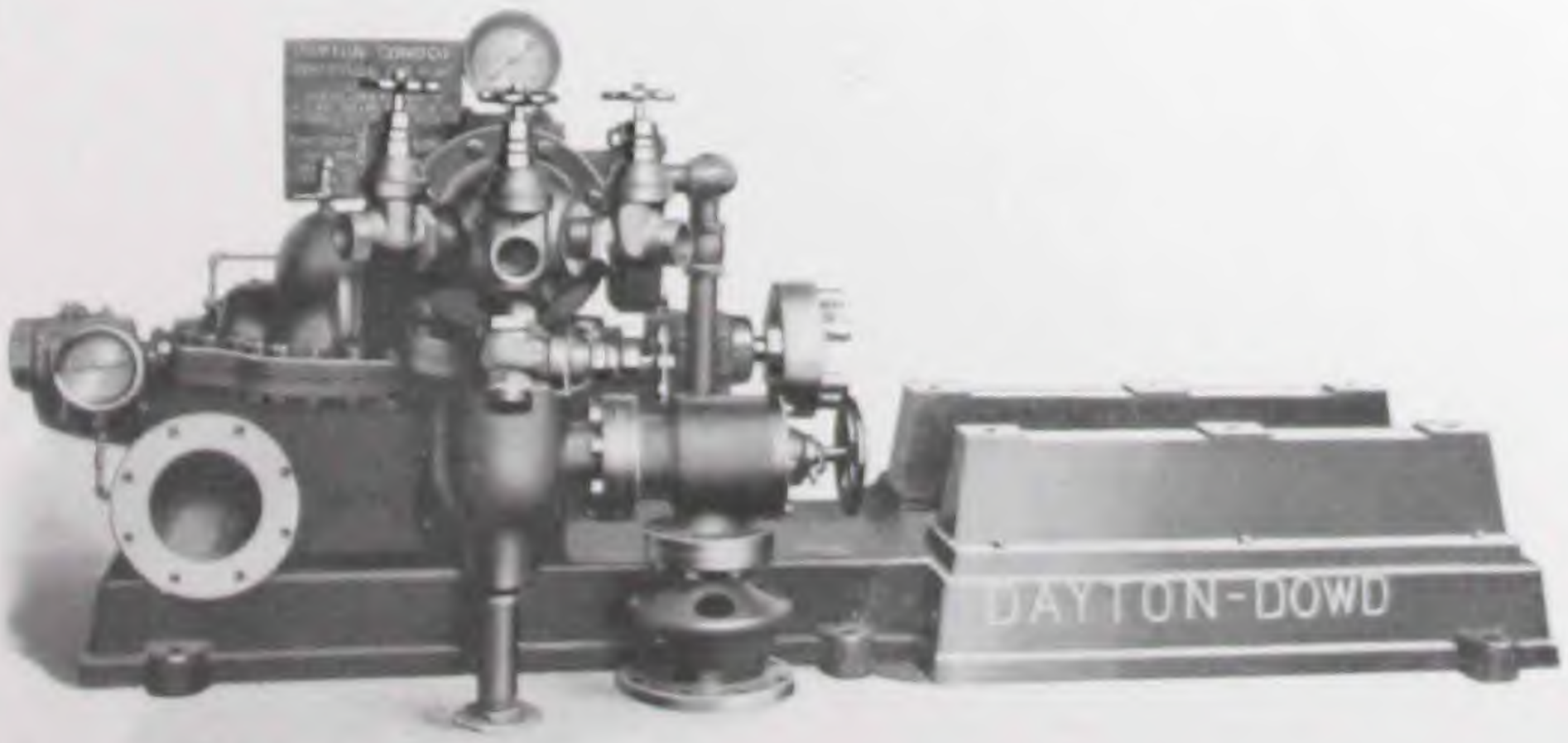


Fig. 116. Dayton-Dowd Type CSU Automatically Balanced Approved Underwriters' 1,000 Gallon Centrifugal Fire Pump. Four 1⅛" Hose Streams at 100 lbs. Pressure

GASOLINE ENGINE DRIVEN FIRE PUMPS

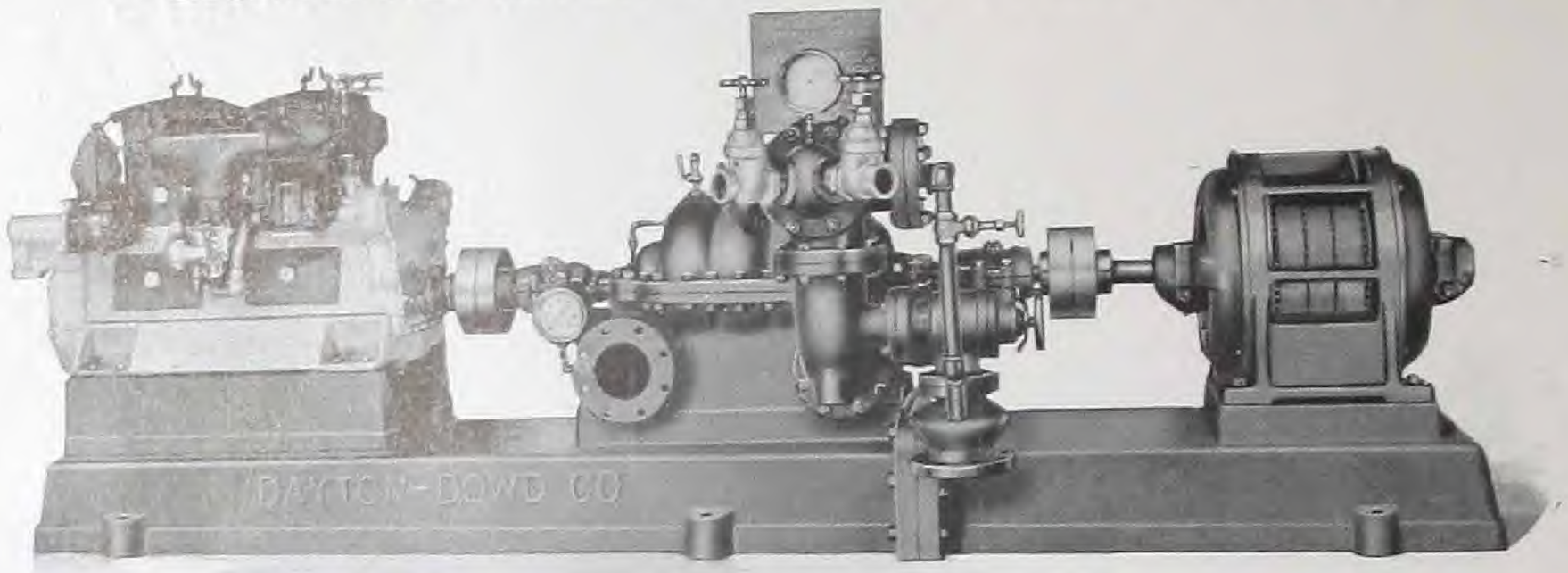


Fig. 182. Dayton-Dowd Approved Underwriters' Centrifugal Fire Pump arranged with dual drive consisting of electric motor and auxliary gasoline engine. Capacity 500 gallons against a head of 100 lbs., speed 1150 RPM.

Isolated industrial plants, as well as towns and villages which are dependent upon one source of power for the operation of fire pumps frequently install auxiliary gasoline engine driven pumping outfits as standby units. Others install a double drive consisting of electric motor or turbine and gasoline engine, one mounted on each side of the fire pump as shown on this page. This is a convenient method of installation and affords perfect dependability in case of failure of the electric or steam power. The gasoline engine drive for fire pumps is approved by the Associated Factory Mutual Fire Insurance Companies as well as the National Board of Fire Underwriters for special installations.

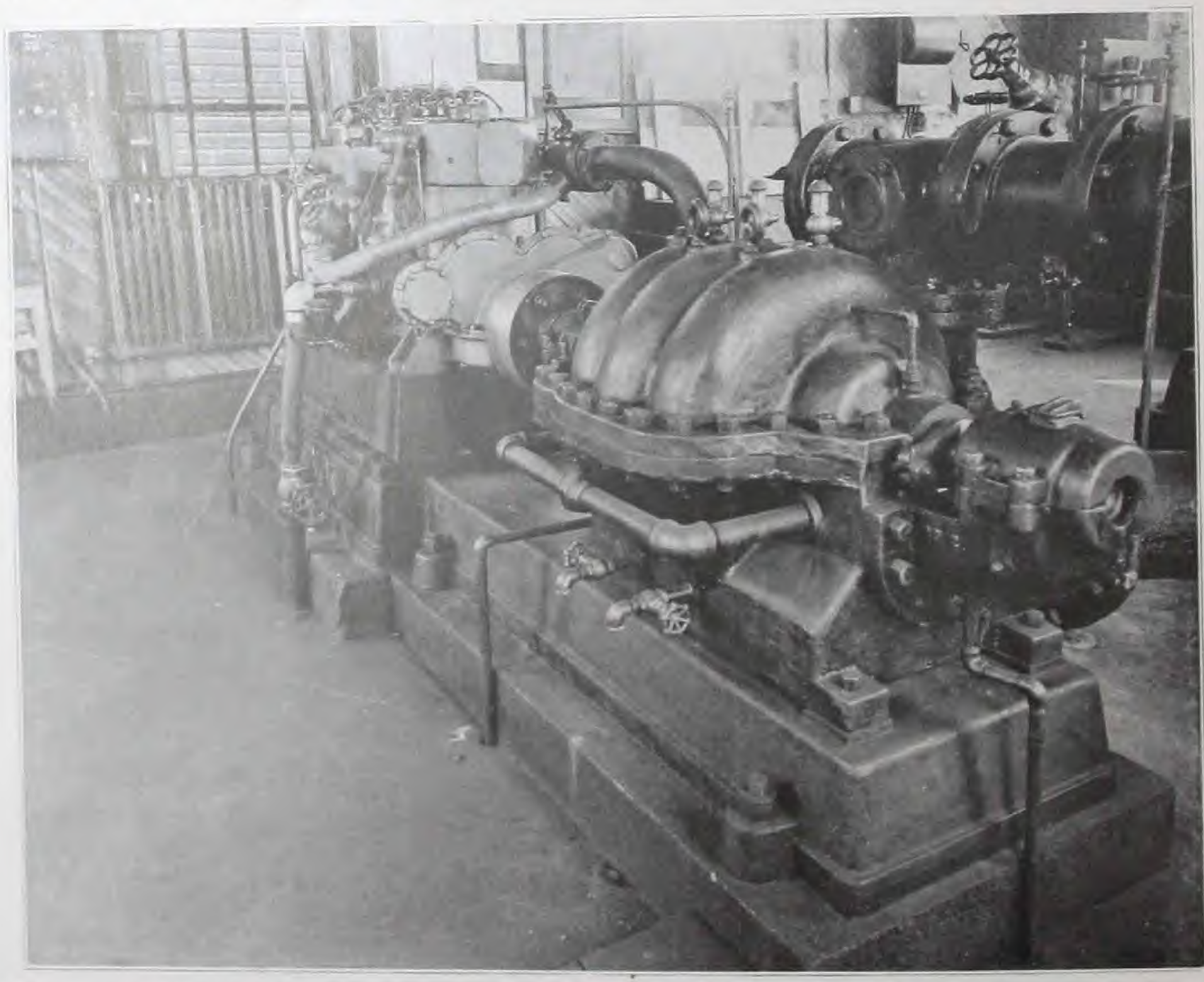


Fig. 111. Dayton-Dowd Approved Underwriters' Centrifugal Fire Pump installed in United States Naval Station, Cape May, N. J. This is a three-stage pump having a capacity of 100 gallons against a pressure of 100 lbs. Driven by gasoline engine at speed of 1200 RPM.

TURBINE DRIVEN CENTRIFUGAL FIRE PUMPS

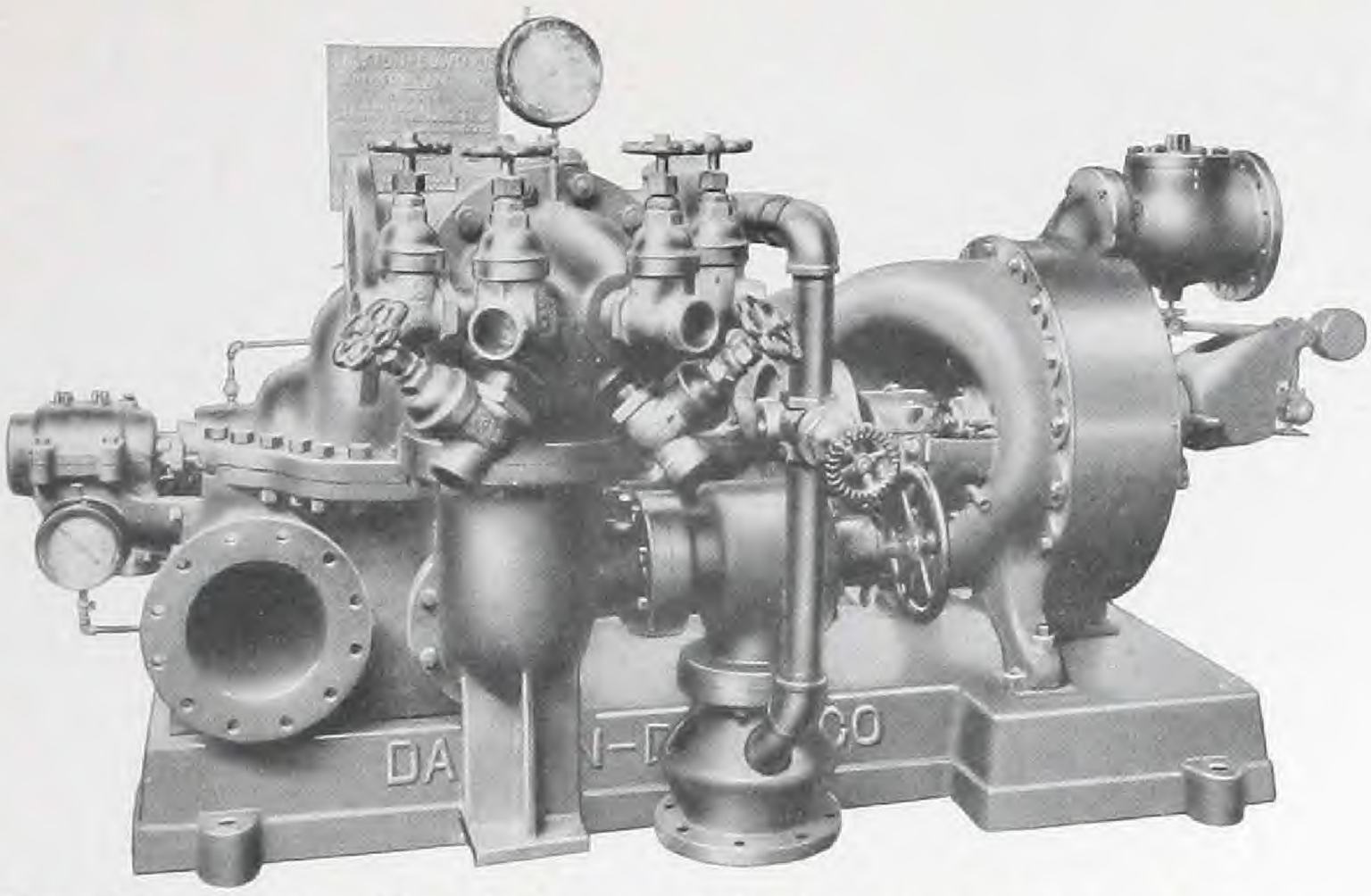


Fig. 127. Dayton--Dowd Approved Underwriters 1,500 Gallon Centrifugal Fire Pump Direct Connected to Steam Turbine. Six 1⅛" Hose Streams Against a Pressure of 100 lbs.

Where a dependable source of steam is available, steam turbine driven centrifugal fire pumps are quently installed. Steam turbines for driving centrifugal fire pumps must be capable of driving pump at ed speed and load with steam pressures varying from 75 to 150 pounds. The turbine driven fire pump cause of its adjustable speed characteristic is advantageously used for installations where it is necessary or irable to pump against high pressures with a reduced capacity, as in the case of very tall buildings or long e lines. For such conditions DAYTON-DOWD impellers are designed with a steep characteristic. The flexity and dependability of steam turbine centrifugal fire pumps are important factors in their favor.

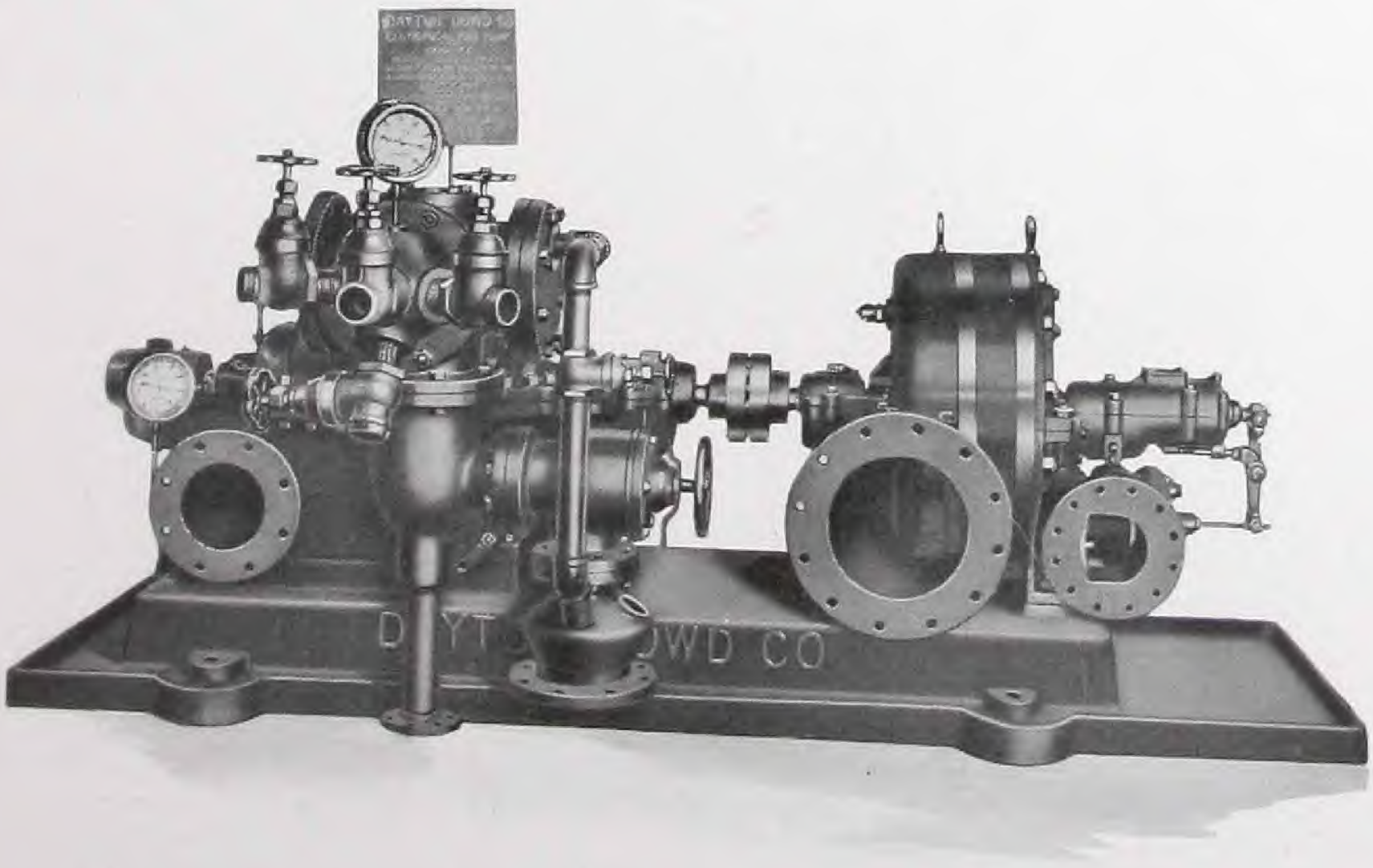


Fig. 195. Dayton-Dowd Approved Underwriters 1,000 Gallon Centrifugal Fire Pump Direct Connected to Steam Turbine. Four 1⅛" Hose Streams Against 100 lbs. Pressure

THE PUMP

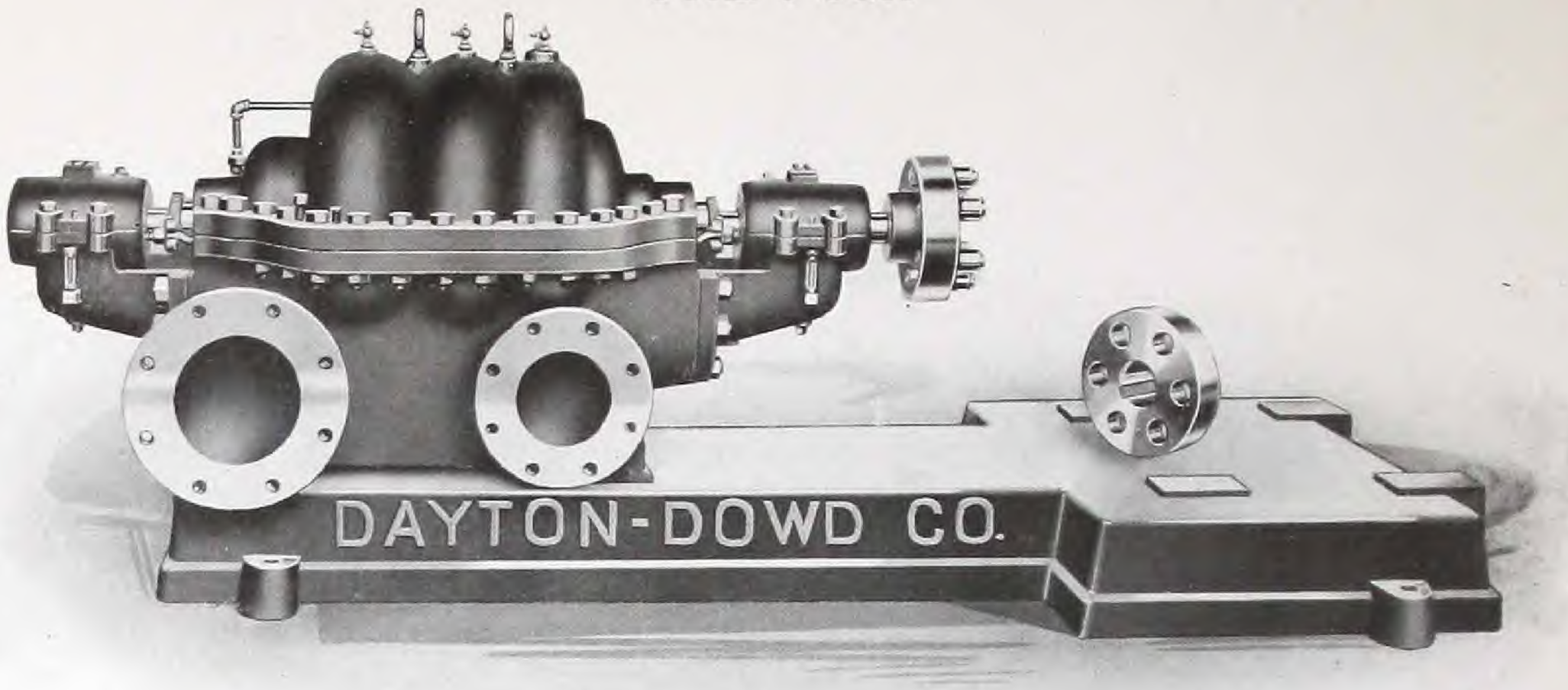


Fig. 631

The cut above and sectional view below illustrate the construction of the DAYTON-DOWD type CSU automatically balanced centrifugal fire pump. This shows the pump without fire fittings attached, and without prime mover. The compactness and simplicity of design together with rugged construction are clearly revealed from a study of these illustrations.

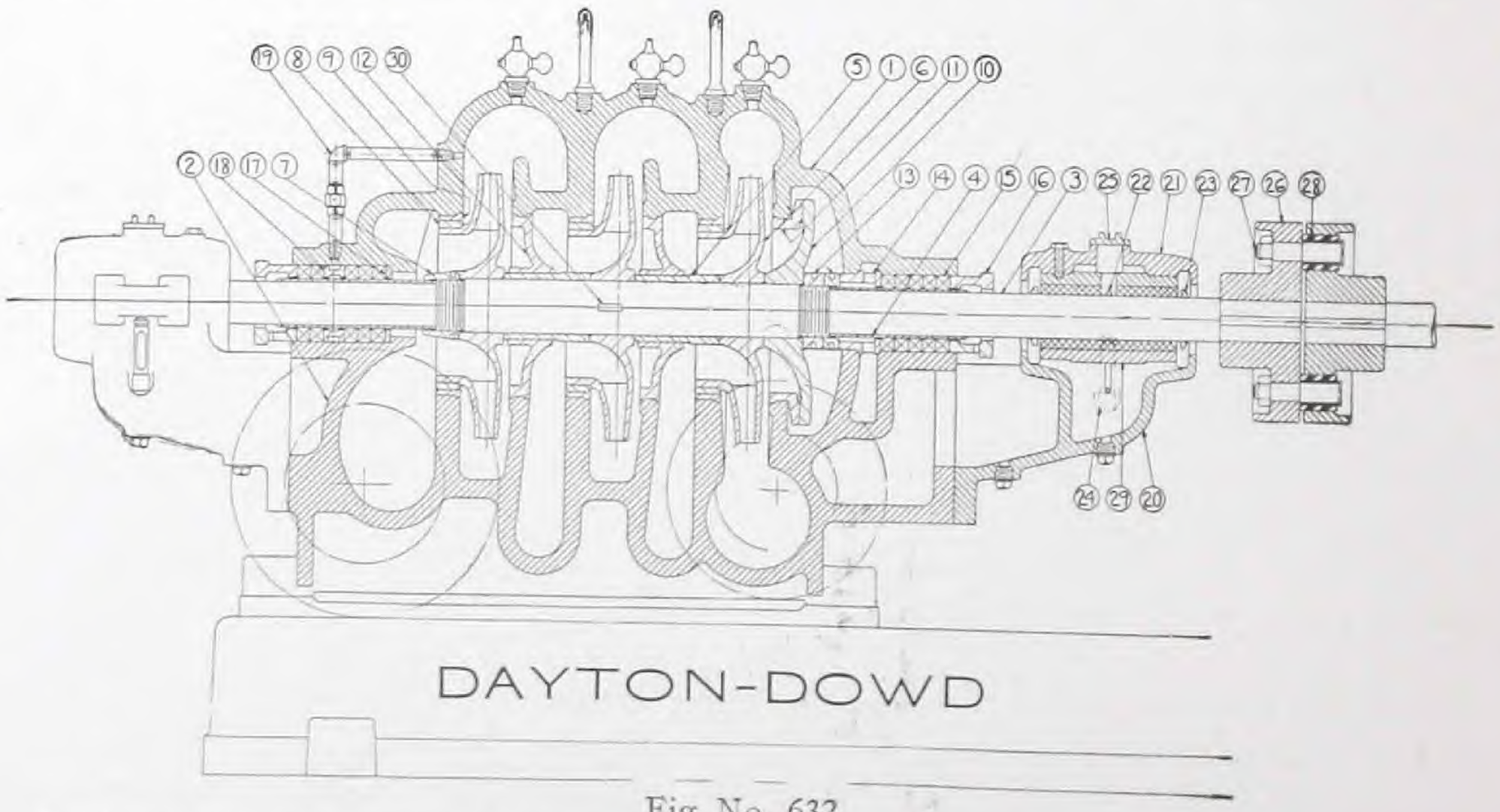


Fig No. 632

Sectional View of Type CSU Multi-Stage Automatically Balanced Approved Underwriters Centrifugal Fire Pump

Patented

1—Upper Casing (CI)
2—Lower Casing (CI)
3—Shaft (Steel)
4—Shaft Sleeves (Bronze)
5—Spacing Sleeves (Bronze)
6—Impeller (Bronze)
7—Impeller Nuts (Bronze)
8—Impeller Wearing Rings (Br.)
9—Case Wearing Rings (Bronze)
10—Balance Disc (Bronze)
11—Balance Disc Seat (Bronze)
12—Case Bushings (Bronze)
13—Lock Nuts (Bronze)
14—Water Seal Rings (Bronze)
15—Packing
16—Stuffing Box Glands (Bronze)
17—Stuffing Box Bottom (Bronze)
18—Skeleton Rings (Bronze)
19—Water Seal Piping (WI)
20—Bearing Brackets (CI)
21—Bearing Cap (CI)
22—Oil Rings (Bronze)
23—Oil Guards (Bronze)
24—Oil Gauge
25—Oil-hole Cover (CI)
26—Coupling (CI)
27—Coupling Pin (Steel)
28—Coupling Bushings (Rubber)
29—Bearing Shells (CI & Babbitt)
30—Woodruff Keys (Steel)

SPECIFICATIONS DAYTON-DOWD CENTRIFUGAL FIRE PUMPS

The pump proper consists of the DAYTON-DOWD type CSU automatically balanced multi-stage design, the number of stages being determined by the pressure to be developed by the pump and the speed available for driving within the limits specified by the Underwriters. Motor speeds allowable are standard speeds not exceeding 1800 RPM. Steam turbine speeds must not exceed 2500 RPM. Underwriters specifications limit the number of stages to four.

DAYTON-DOWD type CSU Fire Pumps are of the split case design, the upper half being easily removable for inspection or repairs without disturbing the alignment or piping. The suction and discharge nozzles are cast integral with lower half of casing. The bearings are separate from the pump chamber proper so water cannot leak into them through the stuffing boxes. The bearings are of the cast iron split shell type lined with genuine babbitt. The pump casing is cast of close grained grey iron of sufficient strength to withstand the pressure developed by the pump with a large factor of safety.

The impellers, impeller and case wearing rings, water seal, stuffing boxes, gland bolts and all fittings are made of bronze. The shaft is of high carbon steel accurately turned and ground and is protected from contact with liquids by bronze sleeves. A cast iron bedplate of the box type extends under the pump and prime mover.

FIRE PUMP FITTINGS

DAYTON-DOWD Centrifugal Fire Pumps are equipped complete with discharge fittings, hose manifold and gauges as specified by the Underwriters. A relief valve is also furnished. Where the fire pump is installed below the sewer level, the open type overflow cone cannot be used, and for such conditions we furnish an overflow cone of the enclosed pattern fitted with glass bulls-eyes so the pump attendant can see the discharge from the starting valve in starting the pump. The discharge fittings are furnished either for the standard of the National Board of Fire Underwriters; the Associated Factory Mutual Fire Insurance Companies; or of the type used by the Chicago Board of Underwriters.

The DAYTON-DOWD Centrifugal Fire Pumps are approved by the Associated Factory Mutual Fire Insurance Companies; The National Board of Fire Underwriters; and the National Fire Protection Association. DAYTON-DOWD Fire Pumps are built strictly in accordance with the specifications issued by these associations, and comply with all their regulations.

DAYTON-DOWD Centrifugal Fire Pumps are built in the following standard sizes. The Dayton-Dowd Company has also furnished many fire pumps of smaller capacity for various pressures to meet the requirements of local ordinances or Underwriters, and is prepared to supply and install such equipment in any locality.

Size GPM	Size Suction	Size Discharge	Size Relief Valve	Size Starting Valve	Size-Waste Pipe Connection	No. of Hose Valves
500	6″	6″	3″	1¼″	5″	2
750	6″	6″	3½″	1½″	6″	3
1000	8″	8″	4″	2″	7″	4
1500	10″	10″	5″	2½″	8″	6

HIGH PRESSURE INSTALLATIONS

The new Wrigley Building in Chicago is equipped with a Dayton-Dowd Underwriters' approved Centrifugal Fire Pump. This pump is a 5″ 4-stage delivering a capacity of 500 gallons per minute at a pressure of 230 lbs. The pump is driven by a totally enclosed, ventilated type of motor operating at a speed of 1,750 RPM. The photograph of the building shows test stream being delivered by the pump, 70 feet above the top of the tower.

Fig 229

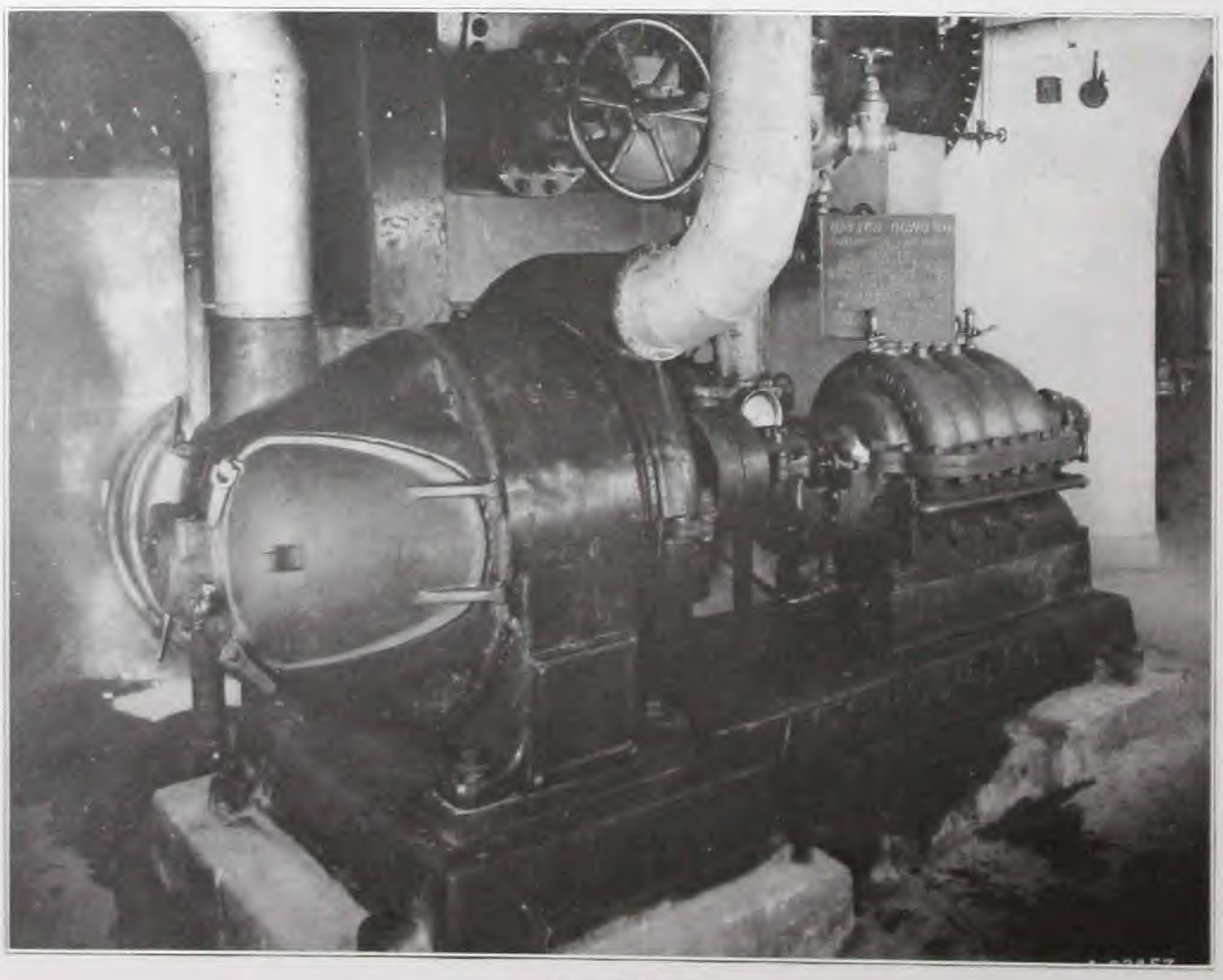


Fig. 230

AN UNUSUAL INSTALLATION

Fig. 233

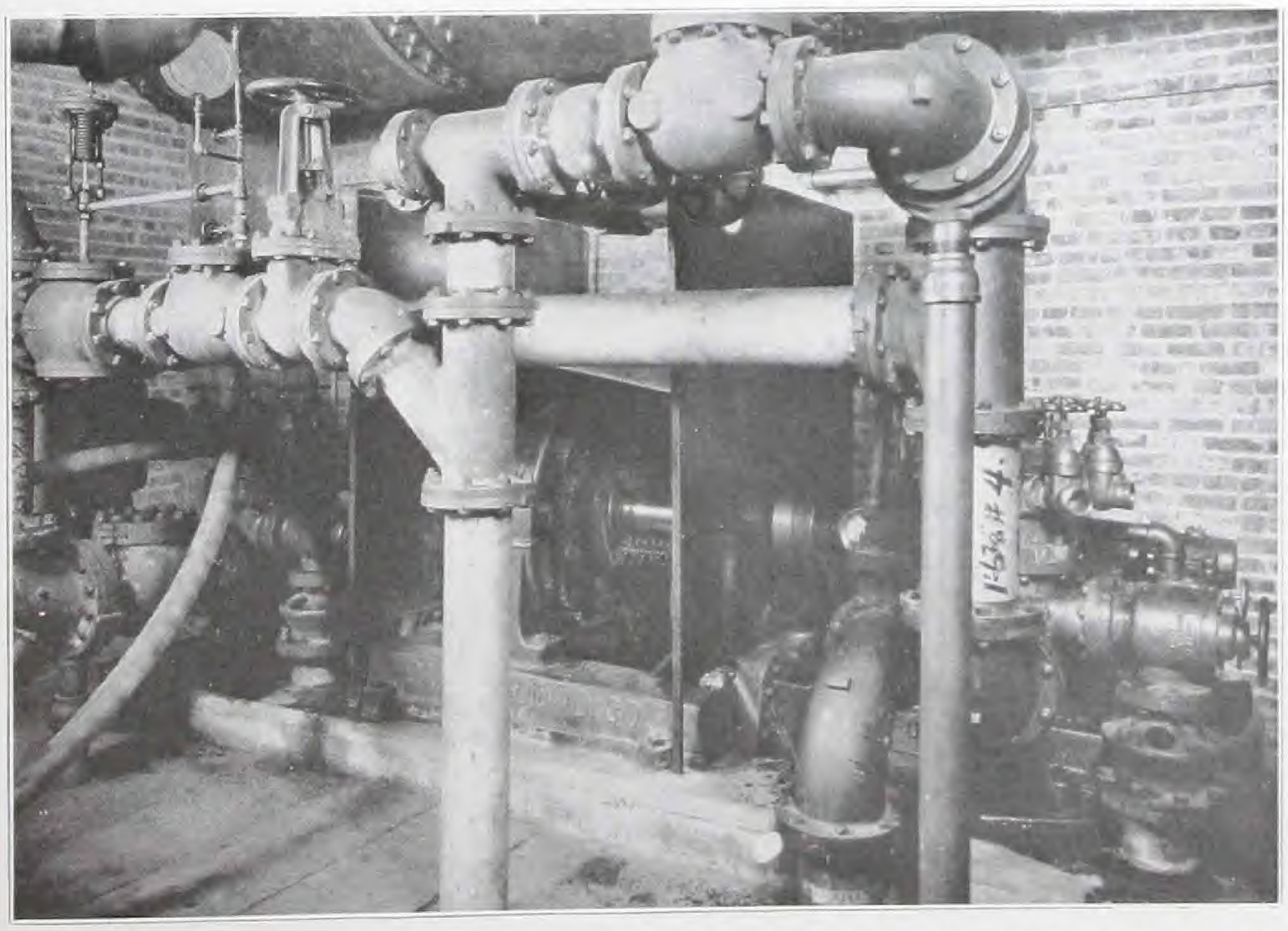


Fig. 231. This installation, in the Chicago Tribune plant, consists of two Dayton-Dowd approve Underwriters' 1,000 gallon Centrifugal fire pumps mounted on one base with driving motor between. Th is rather an unusual unit and is designed to operate in series or parallel under varying conditions of hea and capacity. The Underwriters' acceptance test of this unit showed the following results: 566 gallon against 298 pounds (698 feet) when operated in series; 981 gallons against 230 lbs. in series. When operate in parallel this unit delivers a capacity of 2,000 GPM against a pressure of 100 lbs. In the photograph show above the discharge lines from the pumps were siamesed into one 1¼" discharge nozzle delivering a ca pacity of 566 gallons per minute at a pressure of 298 lbs.

TYPICAL INSTALLATIONS OF DAYTON-DOWD CENTRIFUGAL FIRE PUMPS

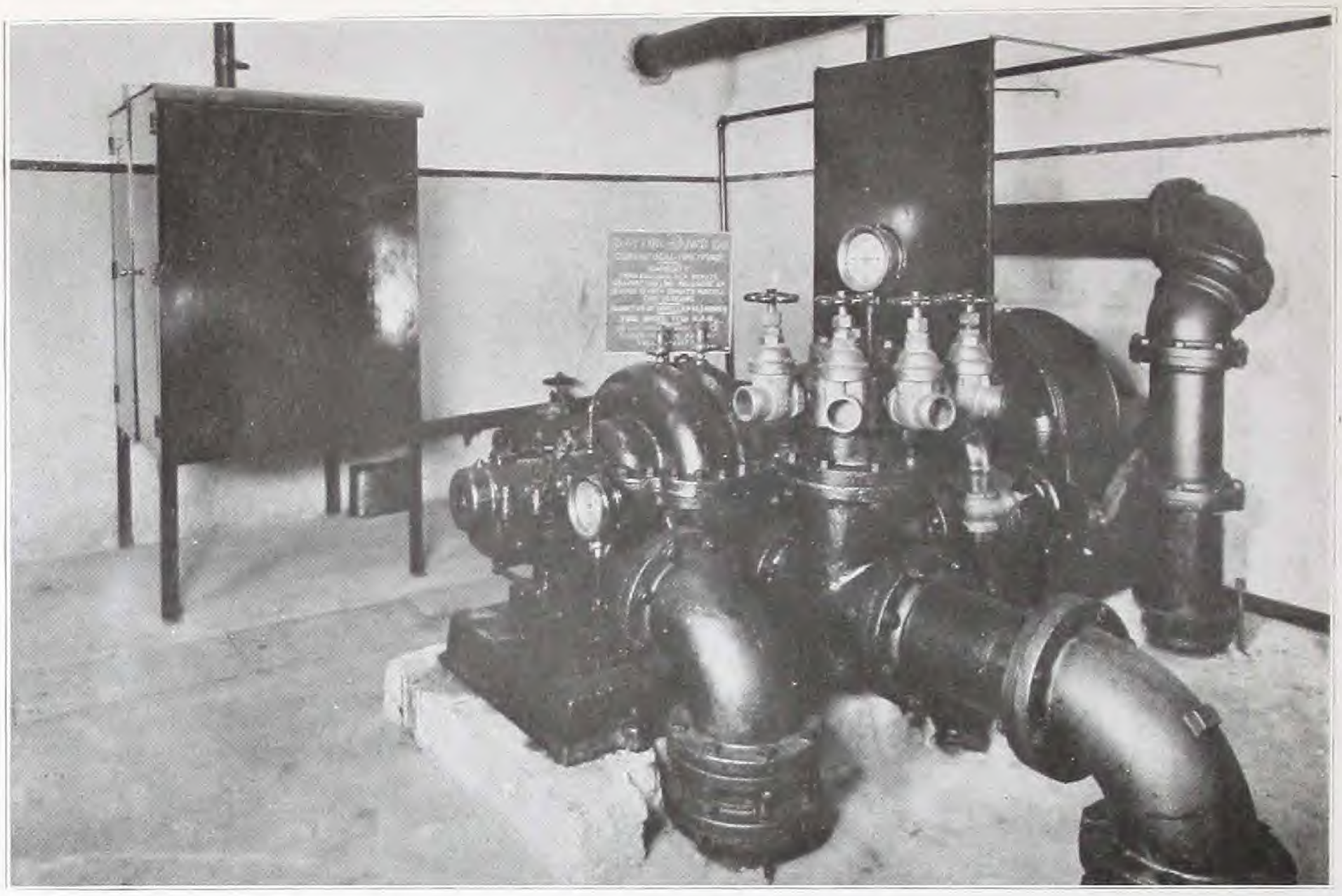


Fig. 102. Dayton-Dowd Approved Underwriters' Centrifugal Fire Pump installed in Packard Motor Car Co. service station, Detroit, Mich. Capacity 1,000 gallons against a pressure of 100 lbs. Driven by electric motor at speed of 1700 RPM.. This installation is controlled by manually operated starter

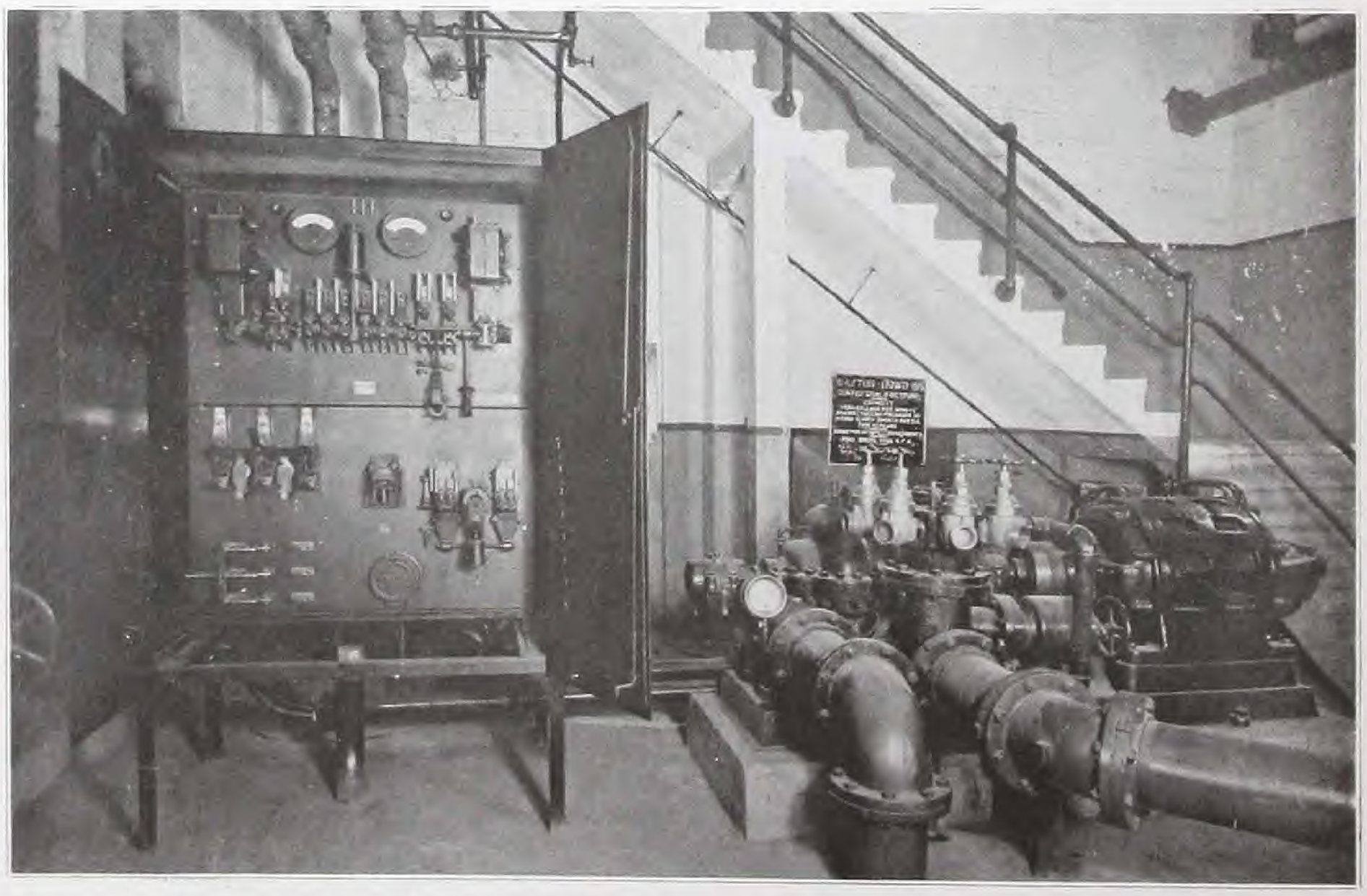


Fig. 101. Dayton-Dowd Approved Underwriters' Centrifugal Fire Pump installed in Cadillac Motor Car Co., Detroit, Mich. Capacity 1,000 gallon against a pressure of 100 lbs. Driven by electric motor at speed of 1700 RPM. This installation controlled by combined manual and automatic control panel

TYPICAL INSTALLATIONS OF DAYTON-DOWD CENTRIFUGAL FIRE PUMPS

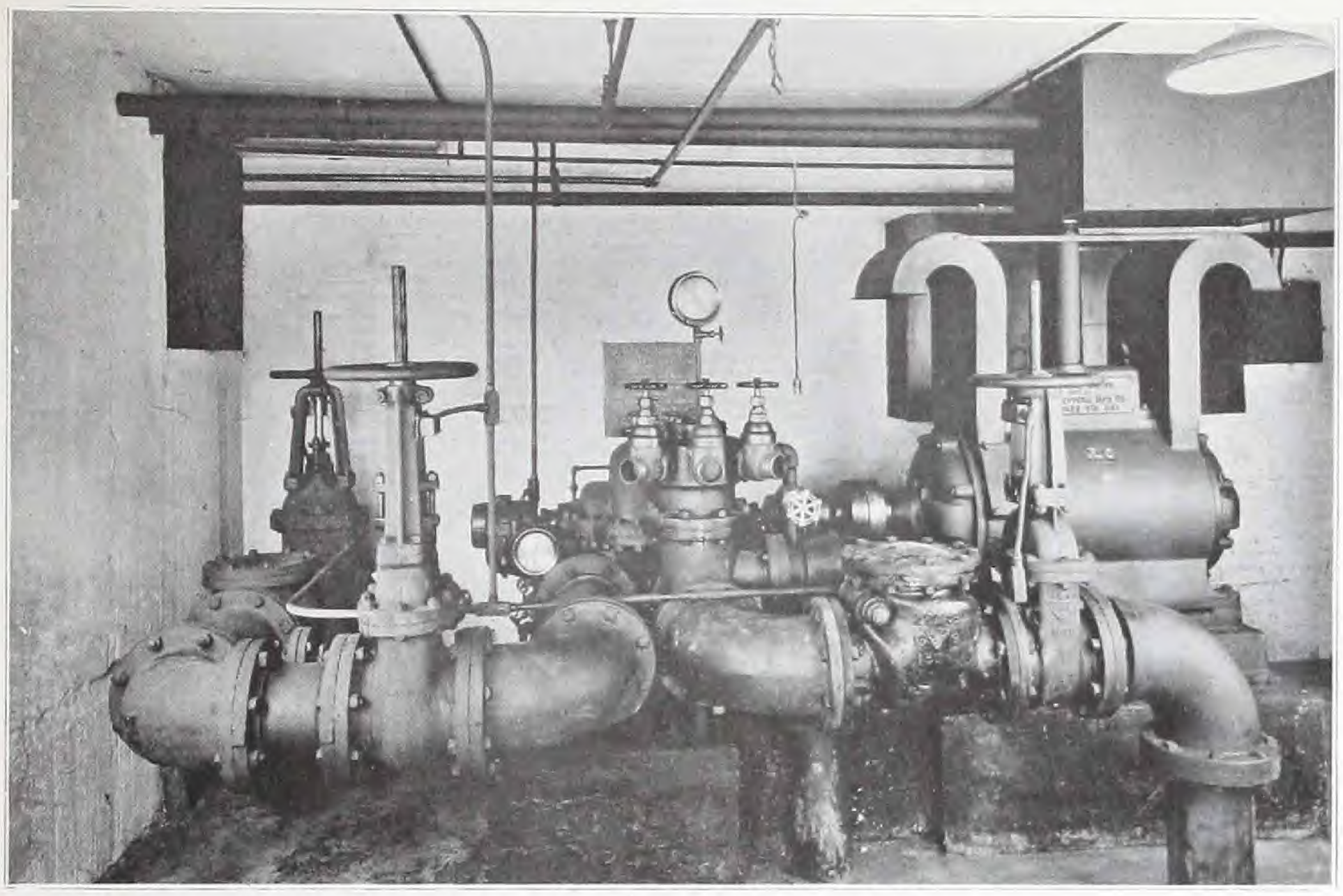


Fig. 234. Dayton-Dowd Approved Underwriters Centrifugal Fire Pump installed in Phillipsborn Catalog House, Chicago. Capacity 1,000 gallons against 100 lbs. pressure. Speed 1750 RPM. This pump is driven by a totally enclosed and ventilated motor

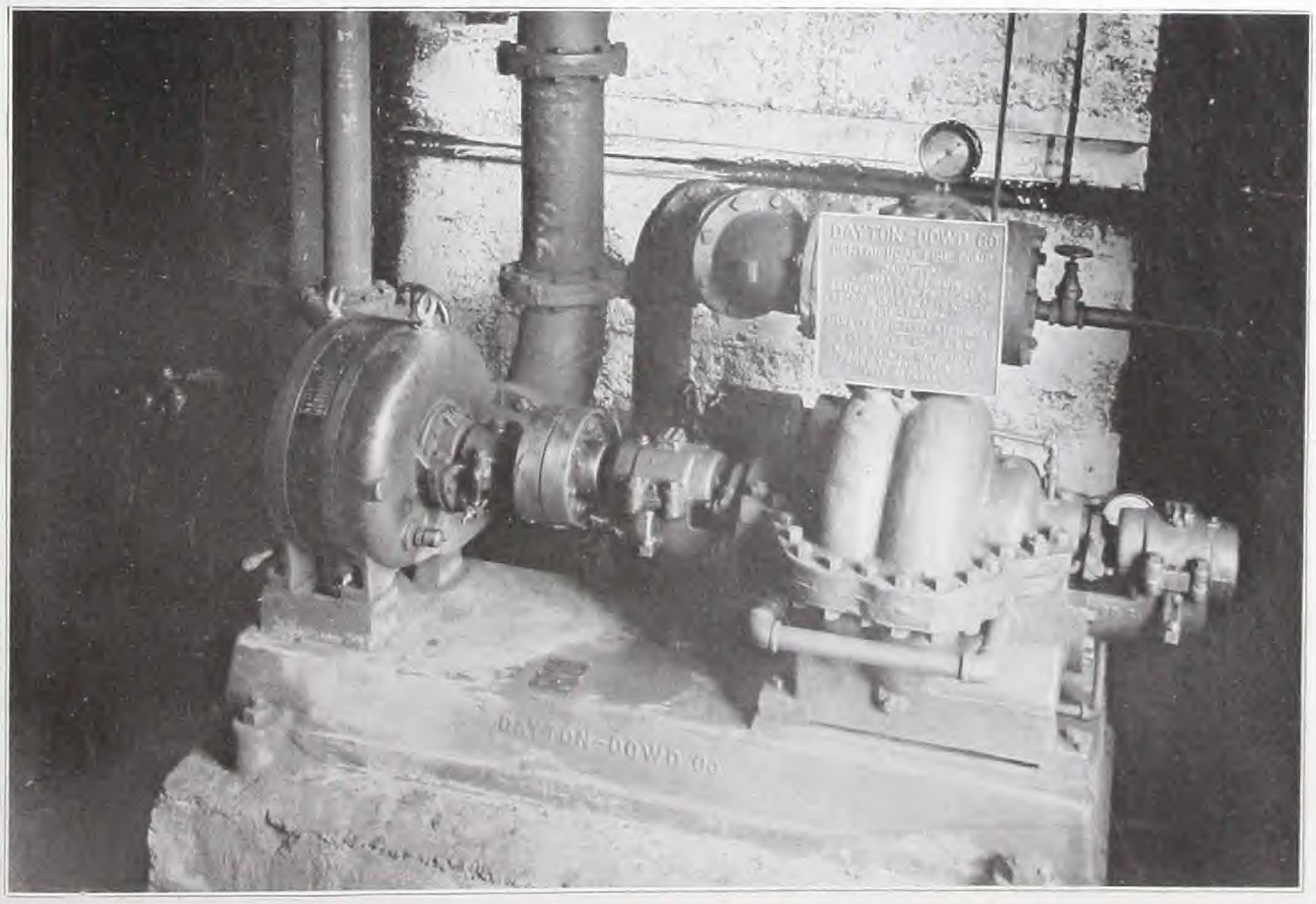


Fig. 207 Dayton-Dowd Approved Underwriters' Centrifugal Fire Pump installed in mine of Chicago, Wilmington and Franklin Coal Co., at West Frankfort, Illinois. Capacity 750 gallons per minute against a pressure of 125 lbs. Driven by steam turbine at speed of 1750 RPM. This pump is installed with discharge facing the wall

DAYTON-DOWD TANK FILLING PUMPS

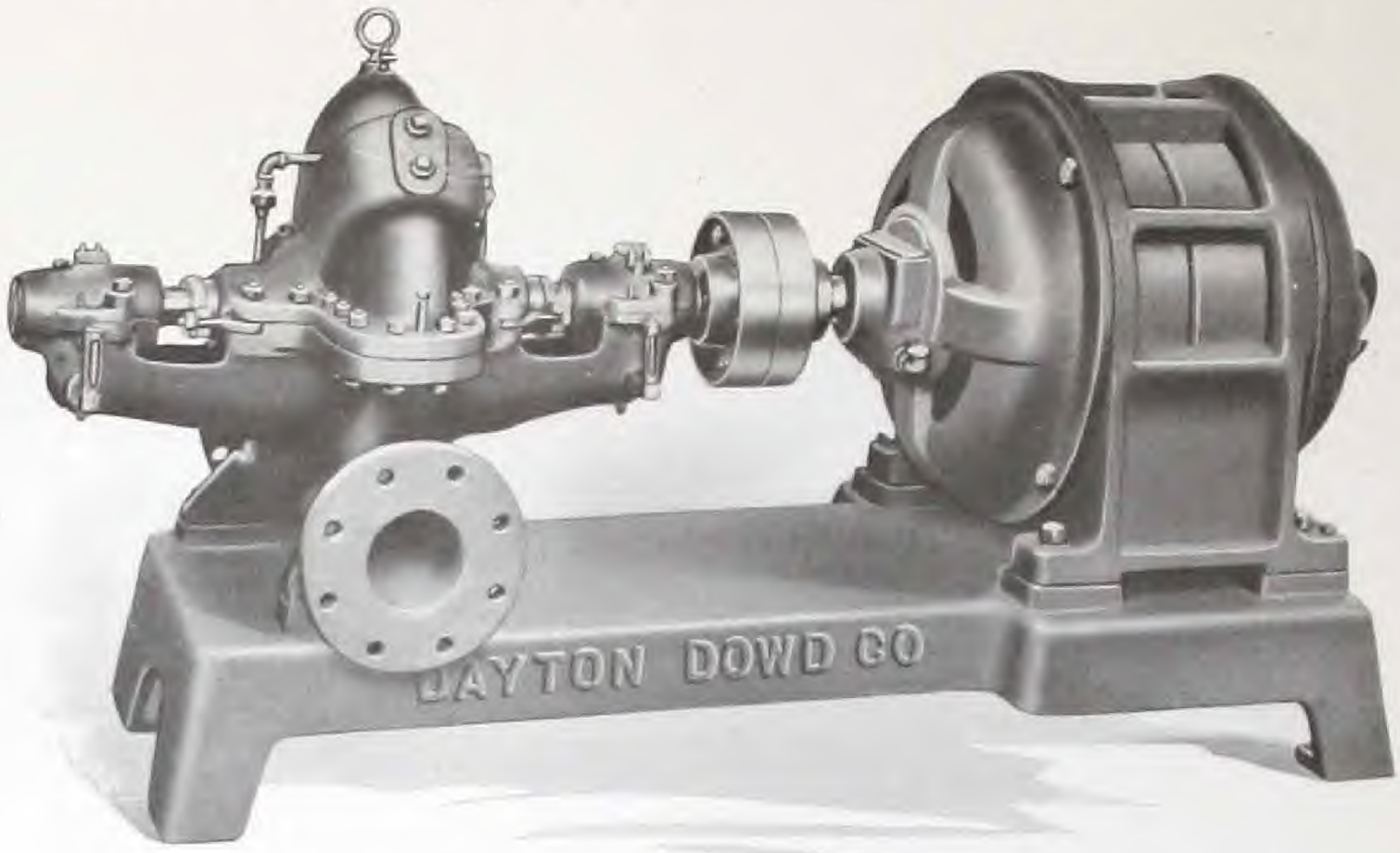


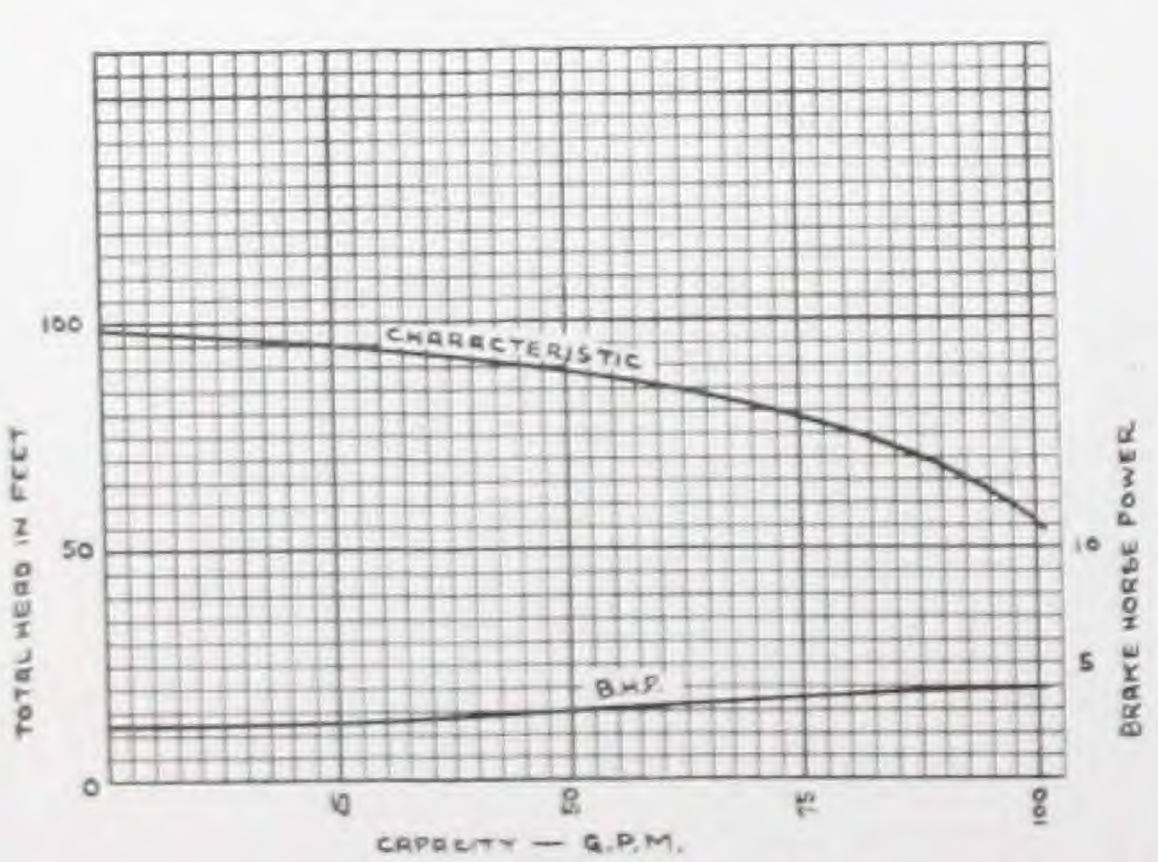
Fig. 228

The DAYTON-DOWD Type CST motor driven tank filling pumps illustrated on this page meet all the requirements of the Underwriters and are approved by the various Inspection Departments.

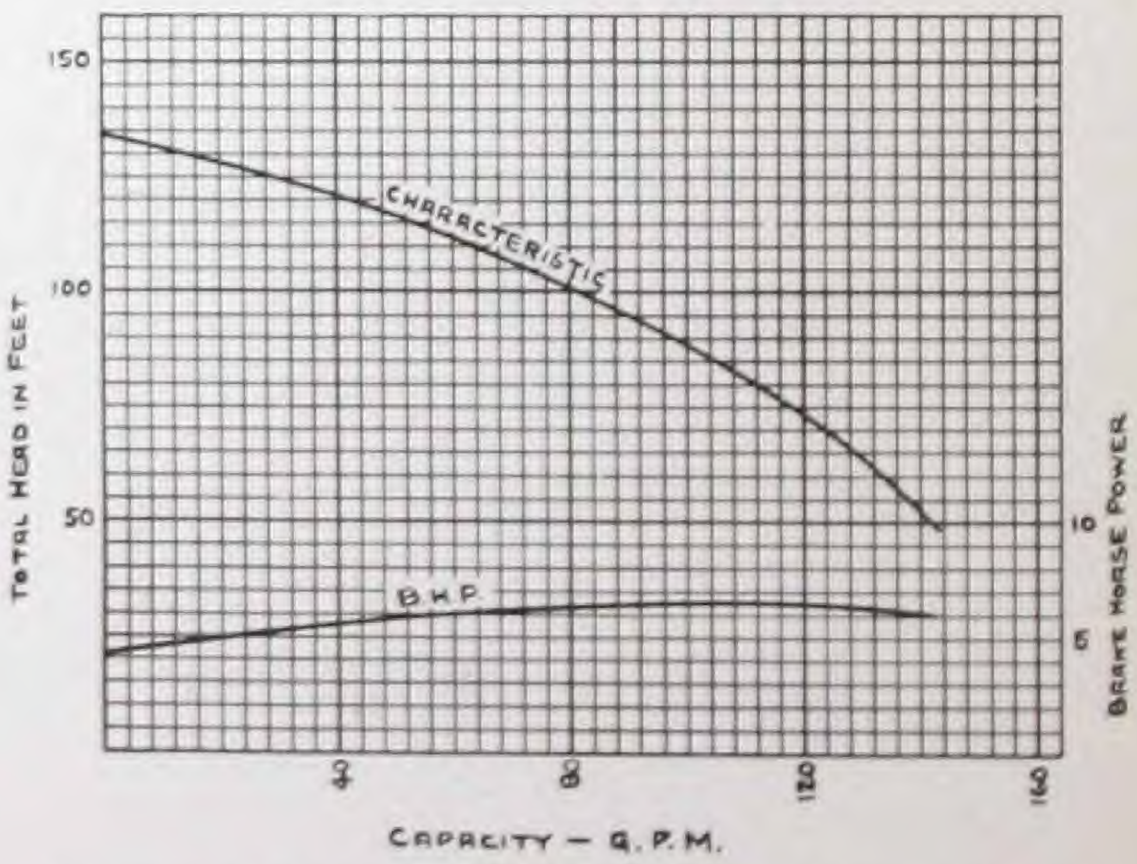
The pump is of the horizontally split case design, the upper half of the case being easily removable for inspection or repair without disturbing the alignment or piping. The bearings are separate from the pump casing proper so that water cannot enter them. They are of the ring oiling babbitted type. The impellers are of the enclosed type made of bronze and protected with case wearing rings. The stuffing boxes are large and of the water sealed type. All fittings are of bronze. The base is a special cast iron pedestal type as illustrated.

Tank filling pumping service requires that the pump operate against a variable head due to the rise and fall of the water in the tank. The DAYTON-DOWD Type CST Pump for this purpose has been developed and designed especially to meet this condition of operation in a most satisfactory manner. The characteristics produced by the impeller design of these pumps show a flat brake horse power curve over a wide range of head and produce a steep characteristic. This characteristic protects the motor from heating and overload under any conditions of service.

In addition to tank filling service the type CST pump is also furnished for house pressure service.



Characteristic curve C749 of type CST 1½" Pump at 1750 RPM.

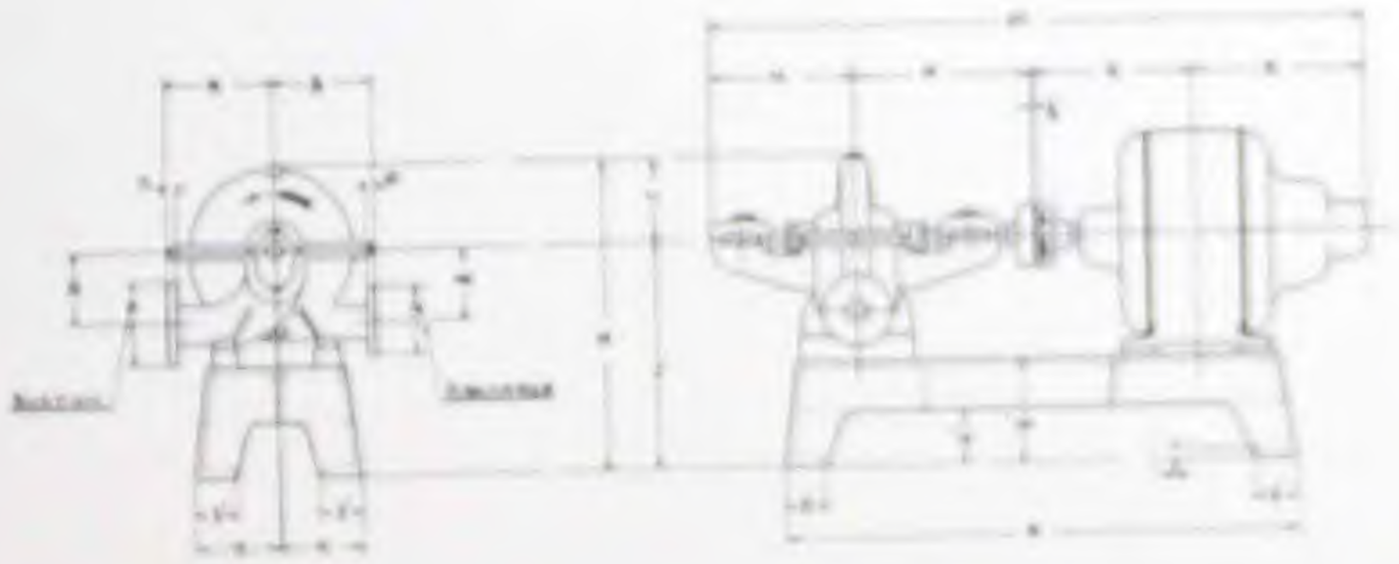


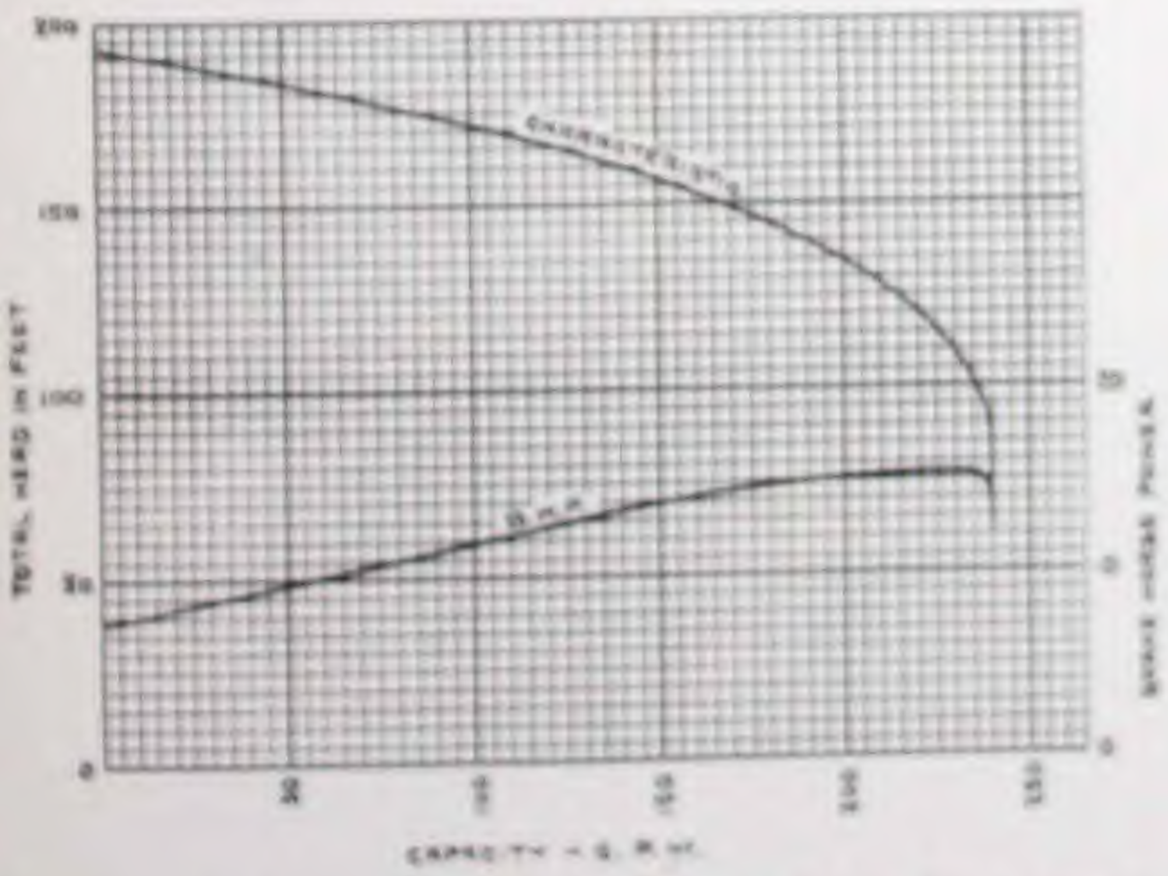
Characteristic curve C750 of type CST 2" Pump at 1750 RPM.

Note flat brake horse power characteristic for varying head and capacity

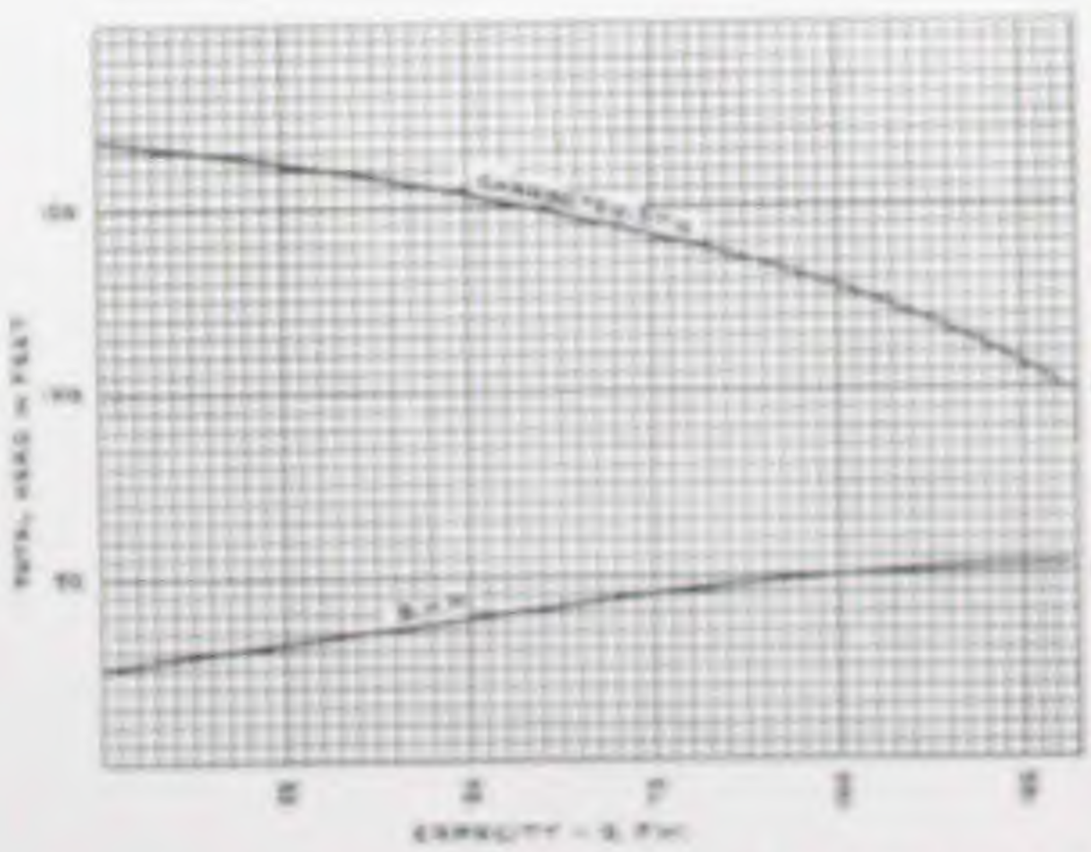
Size of Pump	Size of Discharge	Size of Suction	A	B	C	D	E	H	J	K	L	M	N	P	Q	R	S	T
1½ CST	1½	2	7¾	7⅛	⅜	1/16	5½	21⅛	15⅛	6	6	40	10½	12¼	9¼	6¼	37	7¼
1½ CST	1½	2	7¾	7⅛	⅜	1/16	5½	22⅛	16⅛	6	6	47¼	10½	12¼	11¼	12¼	37	7¼
1½ CST Large	1½	2	10	10	½	½	5½	27	17	7½	10	49½	13¼	16½	11½	8½	43	9½
1½ CST Large	1½	2	10	10	½	½	5½	28½	18½	7½	10	55	13¼	16¼	12	13¼	43	9½
1½ CST Large	1½	2	10	10	½	½	5½	27½	17	7½	10	50⅛	13¼	16¼	11⅛	9	43	9½
1½ CST Large	1½	2	10	10	½	½	5½	29½	19½	7½	10	56⅛	13¼	16¼	12⅛	14 1/16	43	9½
2 CST	2	2½	9½	8	⅛	½	6½	24⅛	16⅛	7	7½	49¼	13¼	16¼	11¼	8	42½	8
2 CST	2	2½	9½	8	⅛	½	6½	25⅛	17⅛	7	7½	54	13¼	16¼	12	12¼	42½	8

Size of Pump	Size of Discharge	Size of Suction	DISCHARGE "G" O. D. Bolt Circle No. & Size			SUCTION "F" O. D. Bolt Circle No. & Size			MOTOR SIZE
1½ CST	1½	2	5	3¼	4—¾ Hole	6	4¾	4—¾ Hole	3 HP. 60 Cyc. 3 Ph. 17
1½ CST	1½	2	5	3¼	4—¾ Hole	6	4¾	4—¾ Hole	3 HP. D. C. 1750 R. P.
1½ CST Large	1½	2	5	3¼	4—¾ Hole	6	4¾	4—¾ Hole	10 HP. 60 Cyc. 3 Ph. 17
1½ CST Large	1½	2	5	3¼	4—¾ Hole	6	4¾	4—¾ Hole	10 HP. D. C. 1750 R.P.
1½ CST Large	1½	2	5	3¼	4—¾ Hole	6	4¾	4—¾ Hole	15 HP. 60 Cyc. 3 Ph. 17
1½ CST Large	1½	2	5	3¼	4—¾ Hole	6	4¾	4—¾ Hole	15 HP. D. C. 1750 R.P.
2 CST	2	2½	6	4¾	4—¾ Hole	7	5¼	4—¾ Hole	5 HP. 60 Cyc. 3 Ph. 17
2 CST	2	2½	6	4¾	4—¾ Hole	7	5¼	4—¾ Hole	5 HP. D. C. 1750 R. P.



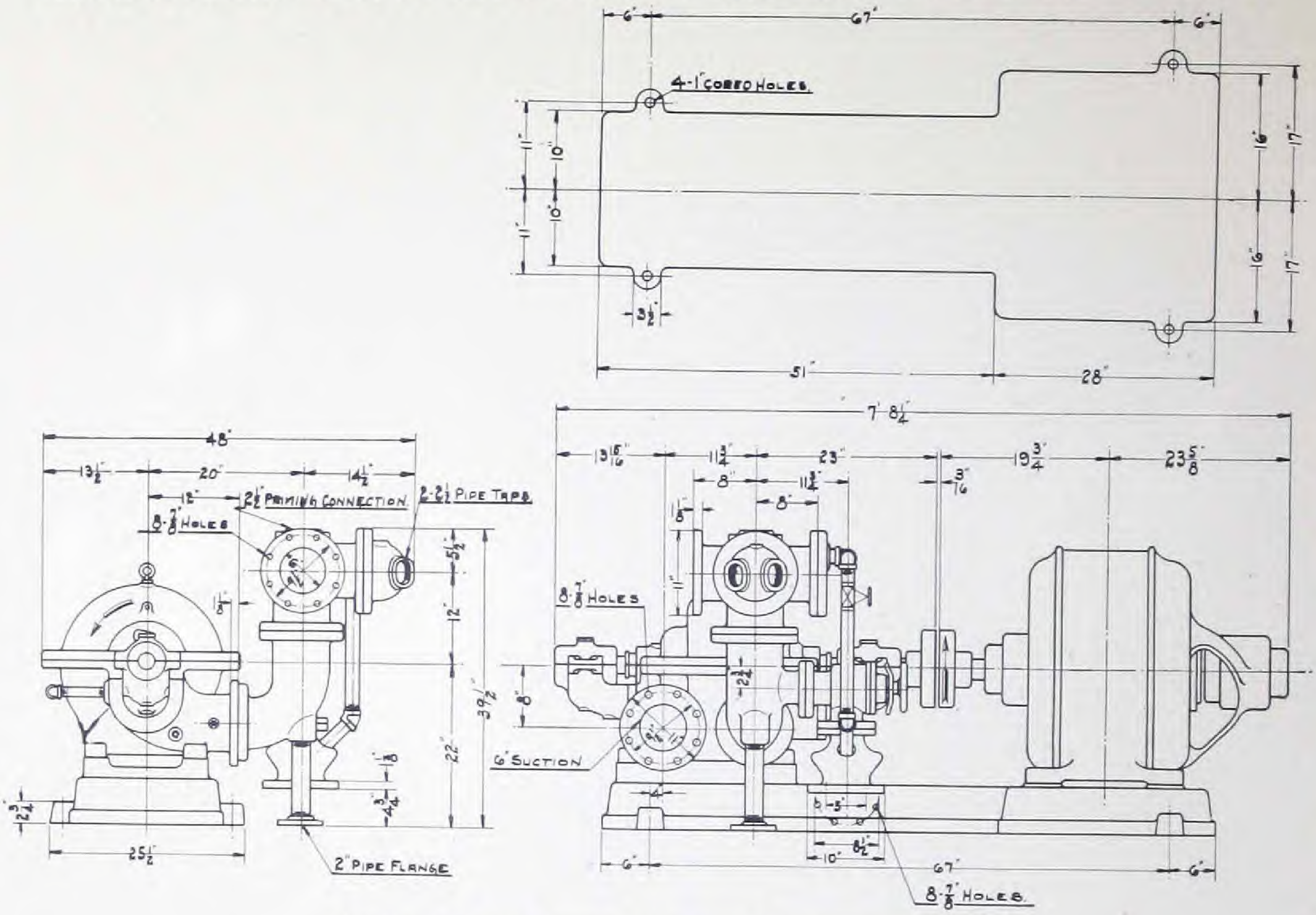


Characteristic curve C1018 of type CST 1½" large casing pump with 15 HP motor

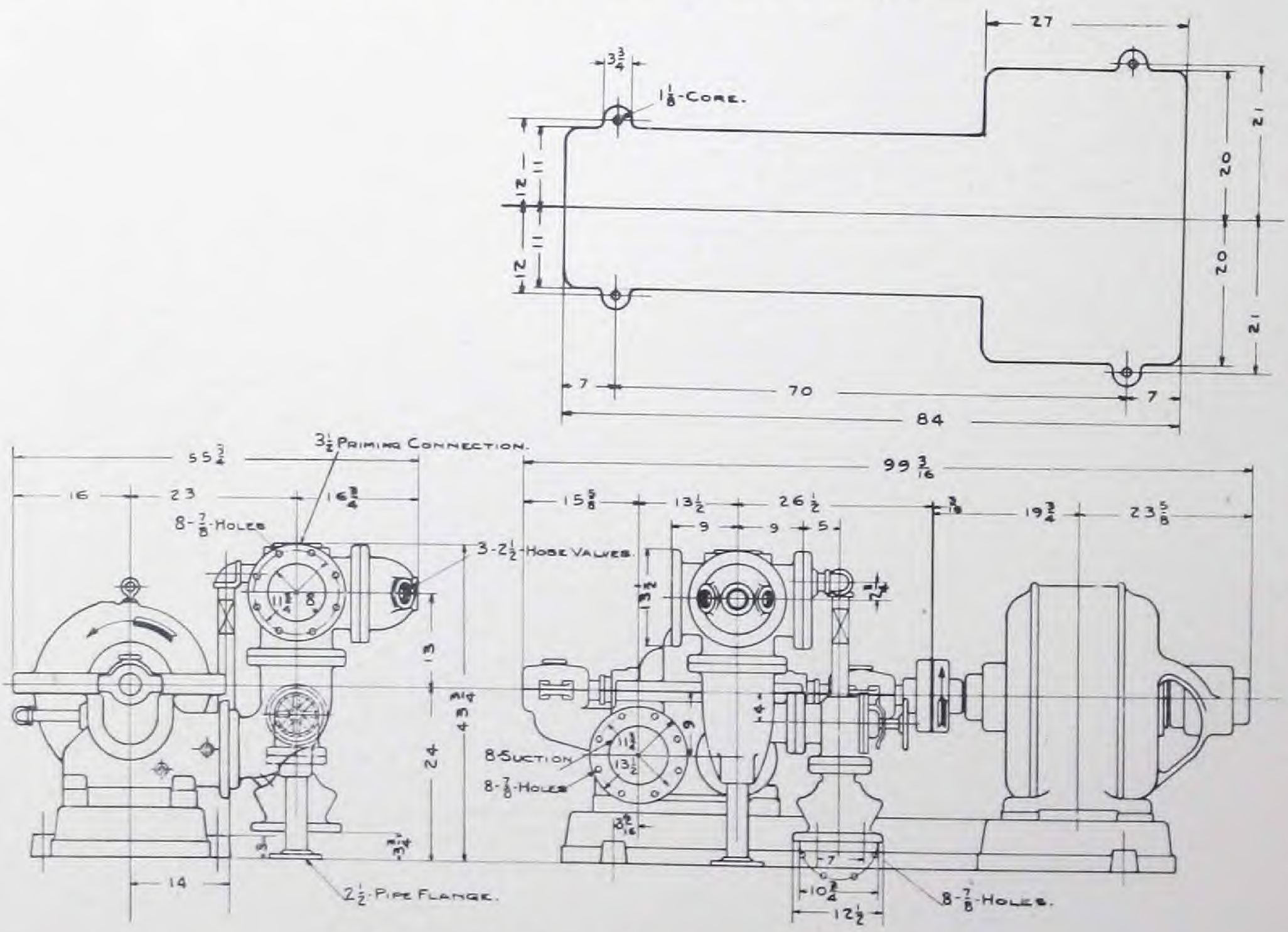


Characteristic curve C1009 of type CST 1½" large casing pump with 10 HP motor

DIMENSIONS DAYTON-DOWD CENTRIFUGAL FIRE PUMPS

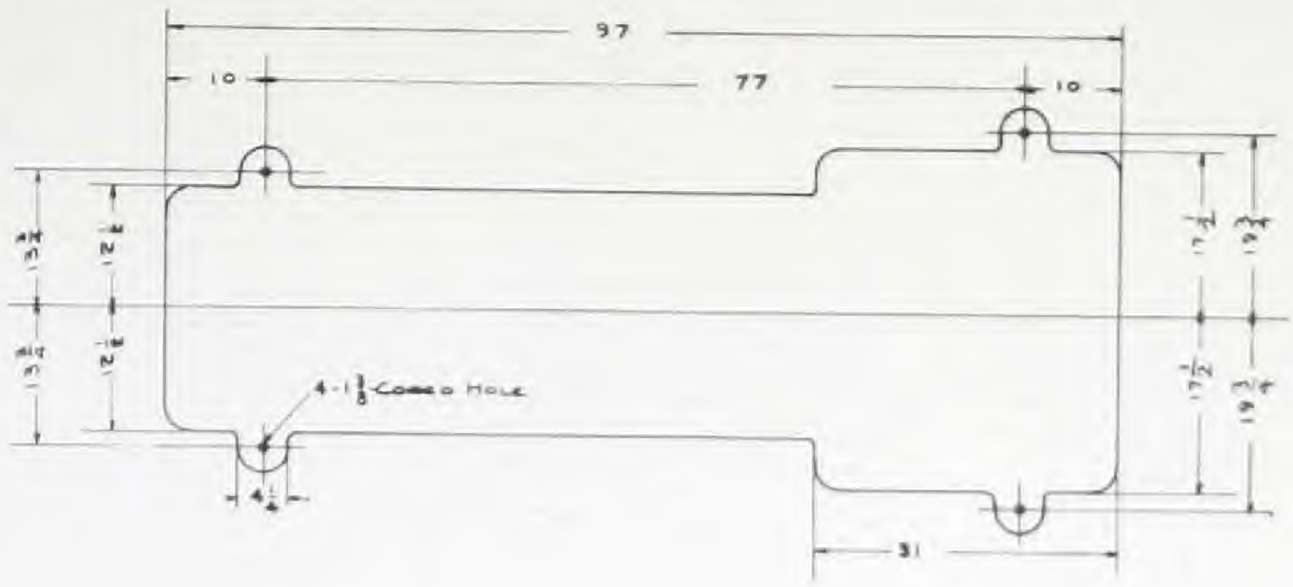


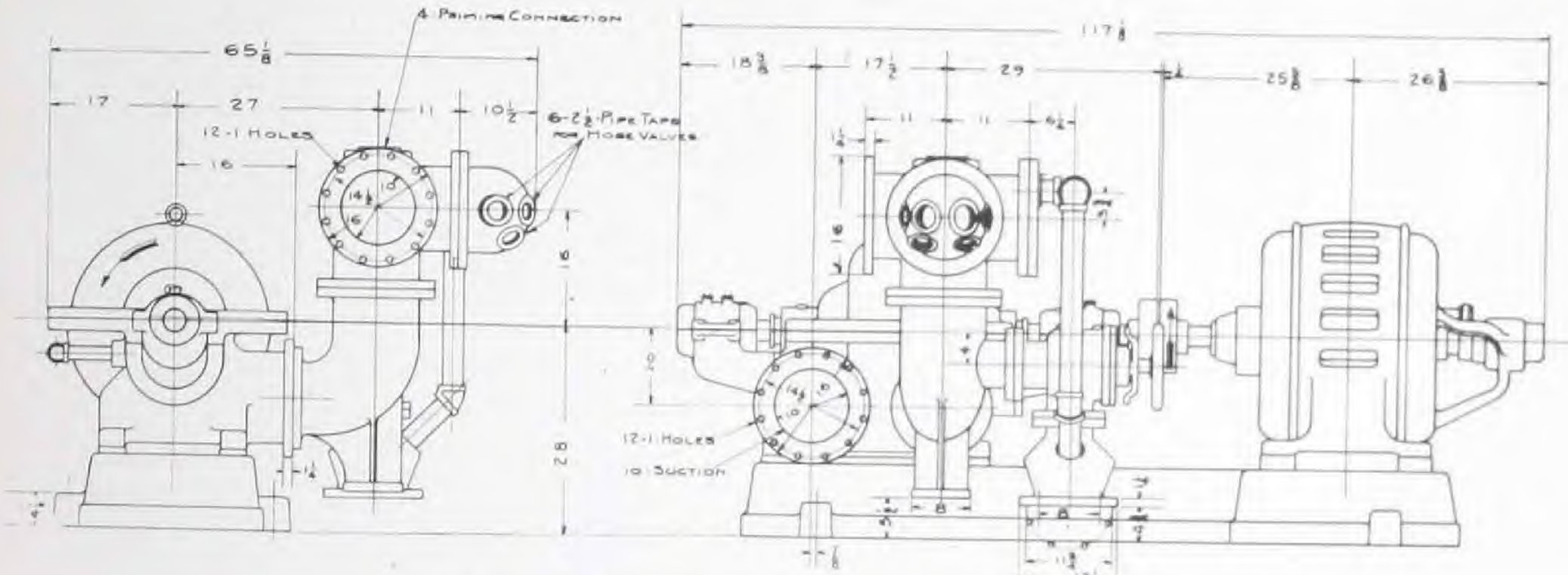
500 Gallon Fire Pump Floor and Elevation Plan



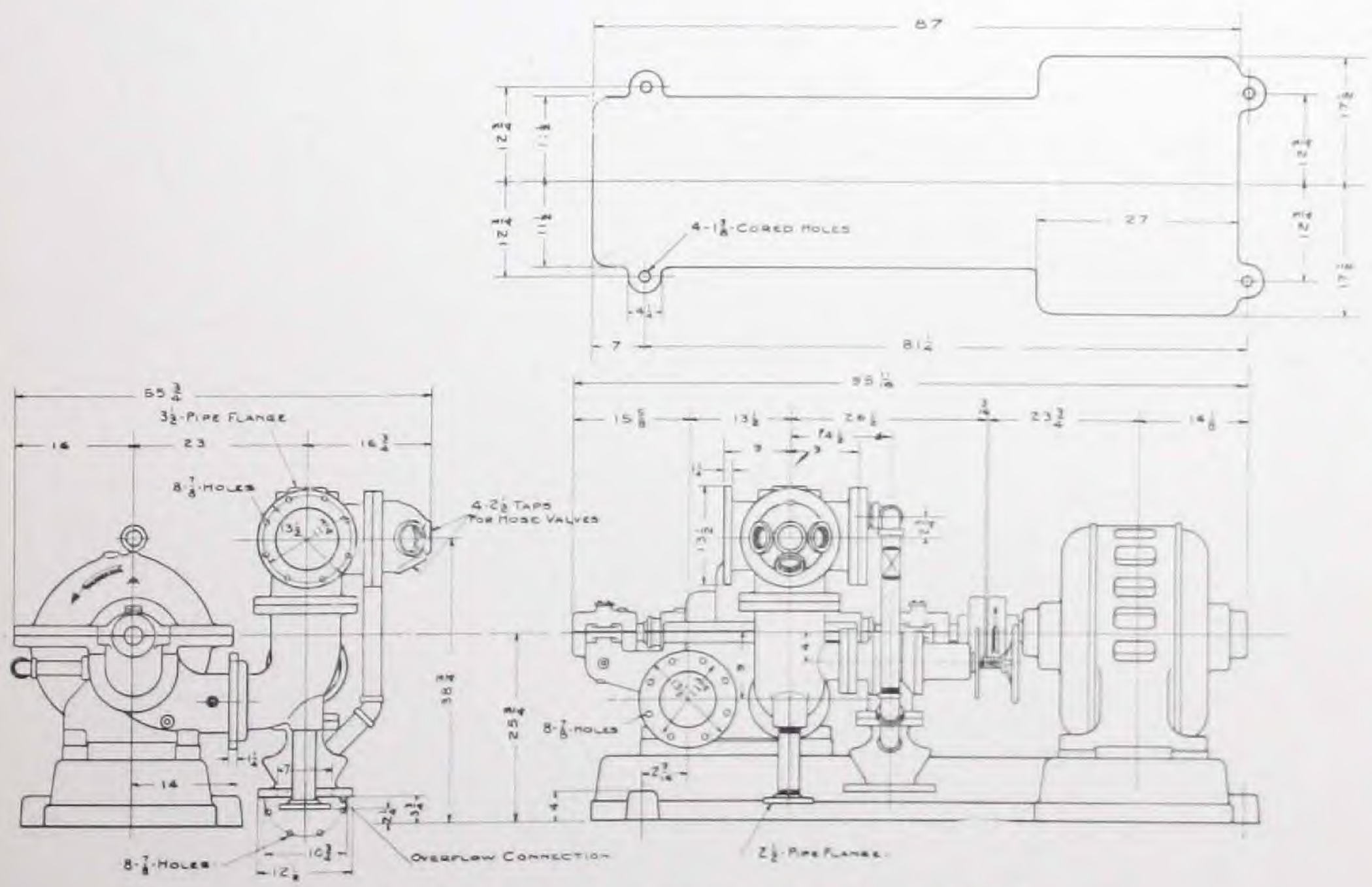
750 Gallon Fire Pump Floor and Elevation Plan

DIMENSIONS DAYTON-DOWD CENTRIFUGAL FIRE PUMPS





1,000 Gallon Fire Pump Floor and Elevation Plan



1,500 Gallon Fire Pump Floor and Elevation Plan

Dayton-Dowd Co. Quincy, Ill.

SUCH CONCERNS AS THESE ARE PROTECTING THEIR PROPERTIES AND SAVIN YEARLY ON THEIR INSURANCE PREMIUMS BY THE INSTALLATION OF DAYTON-DOWD CENTRIFUGAL FIRE PUMPS

500 GALLON FIRE PUMPS

Crerar Library, Chicago.
Wolverine Hotel, Detroit, Mich.
Goetz Apartments, Chicago.
State Lake Theatre, Chicago.
Caner Bldg., Philadelphia, Pa.
Wrigley Building, Chicago.
Kresge Store, Detroit, Mich.
American Bond & Mortgage Bldg., Chicago.
Hirch Bldg., Philadelphia, Pa.
Wilson-Jones Loose Leaf Co., Chicago.
Philadelphia Rapid Transit, Philadelphia, Pa.
Pensacola Compress & Warehouse Co., Pensaco
Fla.
First & Old Detroit Bank Bldg., Detroit, Mich.

750 GALLON FIRE PUMPS

Village of Oscoda, Mich.
Fisher Body Corp., Detroit Mich.
Kling Brothers, Chicago.
Oscar Heineman Bldg., Chicago.
Birk Realty Co., Chicago.
Crosstown Corporation, Detroit, Mich.
Federal Reserve Bank Bldg, Chicago.
Malcolmson Bldg., Detroit, Mich.
A. B. Dick Co., Chicago.
Tuckaseege Mfg. Co., Mt. Holley, N. C.
Pullman Couch Co., Chicago.
Frank & Seder Bldg., Detroit, Mich.
Chicago, Wilmington & Franklin Coal Co., W
Frankfort, Ill.
Davidson Brothers Co., Sioux City, Iowa.
Union Terminal Elevator, Minneapolis, Minn.
Geo Ziegler Candy Co., Milwaukee, Wis.
Phillipsborn's Catalog House, Chicago.
Camp Nissakone Development, Mich.

1500 GALLON FIRE PUMPS

Morgan Gardner Co., Chicago.
Gilbert Paper Co., Menasha, Wis.
Detroit Edison Co., Detroit, Mich.
C. B. & Q. R. R. Co., Cicero, Ill.
Cadillac Motor Co., Detroit, Mich.
Kirk-Latty Co., Cleveland, Ohio.
Armour & Co., Chicago Heights, Ill.
Ashton Mills, Ashton, R. I.
Victor Monaghan Mills, Jordonia, S. C.
Durham Hosiery Mills, Durham, N. C.
Enoree Mills, Enore, S. C.
Rowan Cotton Mills, Salisbury, N. C.
H. W. Cotton Co., Brooklyn, N. Y.
J. W. Murray Co., Detroit, Mich.
Central Paper Co., Muskegon, Mich.
Sycamore Mills, Sycamore, Ala.
Fidelity Products Co., Houston, Tex.
Bardeen Paper Co., Otsego, Mich.
Richmond Chemical Works, Richmond, Va.
Victor Chemical Works, Nashville, Tenn.
Hudson Motor Co., Detroit, Mich.
Fisher Body (Ohio) Corp. (2) Cleveland, Ohio
Detroit Insulated Wire Co., Detroit.
Village of Oxford, Mich.
Nash Motors Co., Milwaukee, Wis.
Butler Brothers, Chicago.
Buhl Company, Detroit, Mich.
Tribune Bldg., Chicago.
U. S. Naval Station, Cape May N. J.
Victor Monaghan Mills, Walhalla, S. C.
Swift & Co., Wilmington, N. C.
Ford Mfg. Co., Vandalia, Ill.
Chicago Carton Co, Chicago.
The Walter Co, Brooklyn, N. Y.
Western Felt Co., Chicago.
Central Bag Co., Chicago.
Ronda Cotton Mills, Ronda, N. C.
Vitanola Mfg. Co., Chicago.
Boston Store, Milwaukee, Wis.
Savona Mfg. Co., Charlotte, N. C.
Cohannett Mills, Spartansburg, W. Va.
Daniel Boone Knitting Mills, Chicago.
Packard Service Station, Detroit.
Chandler Motor Car Co., Cleveland.
Fulton Market Cold Storage Co., Chicago.
National Malleable Castings Co. (2), Cicero, Ill.
Channel Chemical Co., Chicago, Ill.
Economy Fuse Co., Chicago.
Edison Electric Appliance Co, Chicago.
Chicago Storage & Transfer Co., Chicago.
National Malleable Castings Co. (2) Chicago.
Washburn-Crosby Co., Minneapolis, Minn.
Sears Roebuck & Co. (2), Philadelphia, Pa.
Keystone Steel & Wire Co., Peoria, Ill.
Boger & Crawford Spinning Mills, Lincolnton, N
North State Cotton Mills, Taylorville, N. C.
Vitrolite Company, Parkersburg, W. Va.
Clayton Lambert Mfg. Co., Detroit, Mich.
Virginia-Caroline Chemical Co., Pinners Point,
Federal Electric & Walker Vehicle Factory, Chica
Alexander City Cotton Mills, Alexander City, A

1500 GALLON FIRE PUMPS

Buda Company, Harvey, Ill.
Beacon Oil Co., Everett, Mass.
Montgomery Ward & Co., St. Paul, Minn.
The Dayton Co, Minneapolis, Minn.
Continental Motors Corp., Muskegon, Mich.
Reo Motor Co., Lansing, Mich.
H C. Wills & Co., Maryville, Mich.

DAYTON-DOWD COMPANY

MANUFACTURERS OF
Centrifugal Pumps, Approved Underwriters' Fire Pumps
QUINCY, ILLINOIS, U. S. A.

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